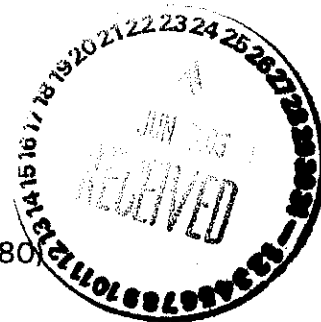


REVIEW COMMENT RECORD (RCR)			1. Date 05/31/05		2. Review No.	
			3. Project No. 200-MW-1		4. Page 1 of 3	
5. Document Number(s)/Title(s) Validation Package for SDG (WSCF20042380)		6. Program/Project/Building Number Characterization Soil Sampling		7. Reviewer RL Weiss		8. Organization/Group ERC - S&DM
						9. Location/Phone Sigma 1 372-9631
17. Comment Submittal Approval: _____ Organization Manager (Optional)		10. Agreement with indicated comment disposition(s) R. L. Weiss _____ Reviewer/Point of Contract 05/31/2005 _____ Date R. L. Weiss _____ Author/Originator		11. Closed 7-13-05 _____ Date Richard L. Weiss _____ Reviewer/Point of Contact Richard L. Weiss _____ Author/Originator		
12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)		16. Status	
1	Inorganic; Pages 25 & 26 are missing.		include		OK RLW	
2	PCB, Semivolatile, & Volatile, Page 1; Subpackages need to include "Appendix 6. Additional Documentation Requested by Client" lines.		can		OK RLW	
3	Radiochemistry, Page 4; First sentence of Minor Deficiencies should start; "Due to lack of blank, duplicate and..."		can		OK RLW	
4	Radiochemistry, Page 11; "U" flag should not be applied for Am-241 results.		can		OK RLW	
5	Radiochemistry, Pages 2,4, 10-12, & 23; Pu and Sr results should not be "J" flagged (all non-detect)		can		OK RLW	
6	Radiochemistry, Pages 2,4, 10-12, & 23; U-238 for B19939 should also be flagged "J". The validation procedure states that result must be greater than 5X the associated blank to not be flagged "J". In this case, 5X blank equals the result. Wording in text (results less than 5X associated blank) is technically incorrect.		can		OK RLW	
7	Semivolatile, Pages 3 & 4; Gasoline range organic QC failure was for LCS not MS.		can		OK RLW	
8	Wet Chemistry; No comments.					

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EDMC

Date: 25 May 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-MW-1 Characterization Sampling and Analysis - Soil
Subject: Wet Chemistry - Data Package No. WSCF20042380 (42380)



INTRODUCTION

This memo presents the results of data validation on Data Package No. 42380 prepared by WSCF Analytical Laboratories. (WSCF). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B19939	12/10/04	Soil	C	See note 1
B19940	12/10/04	Soil	C	See note 1

1 - Anions by 300.0, pH by 9045C, cyanide by 9010B.

* - Nitrate, nitrite and phosphate not validated or reported per FHI.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-MW-1 Miscellaneous Waste Group OU RI/FS Workplan, DOE/RL-2001-65 (Rev. 0), April 2002. Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

• Holding Times/Sample Preservation

Analytical holding times are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 28 days for fluoride and sulfate; 14 days for cyanide; and immediate (24 hours) for pH.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the

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limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blanks**

Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

Matrix Spike

Matrix spike (MS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike and LCS recoveries must fall within the range of 75% to 125%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 125% or less than 75% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 125% and a sample result less than the IDL, no qualification is required.

All matrix spike recovery results were acceptable.

Laboratory Control Sample

The LCS is used to monitor the overall performance of all steps in the analysis. Recoveries must fall within the range of 80% to 120% for LCS analysis. Samples with a recovery of less than 50% are rejected and flagged "UR". Samples with a recovery of 50% to 79% and a sample recovery below the IDL are qualified "UJ".

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Samples with a recovery of greater than 120% or less than 80% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 120% and a sample result less than the IDL, no qualification is required.

All LCS results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 35%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (B19939/B19940) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required target quantitation limits (RTQLs) to ensure that laboratory detection levels meet the required criteria. All results met the RTQL.

- **Completeness**

Data package No. 42380 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

000003

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2001-65, Rev. 0, *200-MW-1 Miscellaneous Waste Group OUs RI/FS Work Plan*, April 2002.

Appendix 1

Glossary of Data Reporting Qualifiers

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Qualifiers which may be applied by data validators in compliance with FHI validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

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Appendix 2

Summary of Data Qualification

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WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: 42380	REVIEWER: TLI	DATE: 5/25/05	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

GENERAL CHEMISTRY ANALYSIS, SOIL MATRIX, (MG/KG)

Page 1 of 1

[illegible]

** - Units are pH units

000010

WSCF ANALYTICAL RESULTS REPORT

Attention:
Project:

Steve Trent
F04-015: F04-015

Group #: WSCF20042380

Sample #	Client ID	CAS #	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
Inorganic													
W040002581	B19939	TRENT	57-12-5	Cyanide	SOIL	LA-695-402 U	< 0.200	mg/kg	1.00	0.20	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	TS	Total solids	SOIL	LA-519-412	90.7	%	1.00	0.0	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	PH	pH Measurement	SOIL	LA-212-411	9.14	pH	1.00	0.010	12/11/04	12/10/04	12/10/04
W040002581	B19939	TRENT	18984-48-8	Fluoride	SOIL	LA-533-410 U	< 1.15	mg/kg	50.00	1.2	01/05/05	12/10/04	12/10/04
W040002581	B19939	TRENT	NO3-N	Nitrogen in Nitrate	SOIL	LA-533-410 U	< 0.950	mg/kg	50.00	0.95	01/05/05	12/10/04	12/10/04
W040002581	B19939	TRENT	NO3-N	Nitrogen in Nitrate	SOIL	LA-533-410 U	5/20/05 2.34	mg/kg	50.00	0.65	01/05/05	12/10/04	12/10/04
W040002581	B19939	TRENT	PO4-P	Phosphate (P) by IC	SOIL	LA-533-410 U	< 2.70	mg/kg	50.00	2.7	01/05/05	12/10/04	12/10/04
W040002581	B19939	TRENT	14808-79-8	Sulfate	SOIL	LA-533-410 B	11.4	mg/kg	50.00	5.0	01/05/05	12/10/04	12/10/04
W040002581	B19939	TRENT	7440-22-4	Silver	SOIL	LA-505-412 U	< 0.810-03	mg/kg	9.81	0.81-03	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	7440-43-9	Cadmium	SOIL	LA-505-412 U	< 0.0196	mg/kg	9.81	0.020	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	7440-47-3	Chromium	SOIL	LA-505-412 U	5.88	mg/kg	9.81	3.3	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	7440-50-8	Copper	SOIL	LA-505-412 U	5/20/05 1.4	mg/kg	9.81	0.63	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	7439-92-1	Lead	SOIL	LA-505-412 U	< 0.255	mg/kg	9.81	0.26	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	7439-97-6	Mercury	SOIL	LA-505-412	0.586	mg/kg	9.81	9.81-03	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	7440-01-1	Uranium	SOIL	LA-505-412	0.331	mg/kg	9.81	0.16	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	57-12-5	Cyanide	SOIL	LA-695-402 U	< 0.200	mg/kg	1.00	0.20	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	TS	Total solids	SOIL	LA-519-412	94.8	%	1.00	0.0	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	PH	pH Measurement	SOIL	LA-212-411	9.18	pH	1.00	0.010	12/11/04	12/10/04	12/10/04
W040002582	B19940	TRENT	18984-48-8	Fluoride	SOIL	LA-533-410 U	< 1.15	mg/kg	50.00	1.2	01/05/05	12/10/04	12/10/04
W040002582	B19940	TRENT	NO3-N	Nitrogen in Nitrate	SOIL	LA-533-410 U	< 0.950	mg/kg	50.00	0.95	01/05/05	12/10/04	12/10/04
W040002582	B19940	TRENT	NO3-N	Nitrogen in Nitrate	SOIL	LA-533-410 U	5/20/05 2.34	mg/kg	50.00	0.65	01/05/05	12/10/04	12/10/04
W040002582	B19940	TRENT	PO4-P	Phosphate (P) by IC	SOIL	LA-533-410 U	< 2.70	mg/kg	50.00	2.7	01/05/05	12/10/04	12/10/04
W040002582	B19940	TRENT	14808-79-8	Sulfate	SOIL	LA-533-410 B	15.0	mg/kg	50.00	5.0	01/05/05	12/10/04	12/10/04
W040002582	B19940	TRENT	7440-22-4	Silver	SOIL	LA-505-412 U	< 0.0101	mg/kg	10.10	0.010	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	7440-43-9	Cadmium	SOIL	LA-505-412 U	5/20/05 0.0202	mg/kg	10.10	0.020	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	7440-47-3	Chromium	SOIL	LA-505-412	7.59	mg/kg	10.10	6.4	12/15/04	12/10/04	12/10/04

MDL = Minimum Detection Limit

B - The analyte < the RDL but > = the IDL/MDL (inorganic)

U - Analyzed for but not detected above limiting criteria.

RQ = Result Qualifier

DF = Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Report WGPP/ver. 1.1

Groundwater Remediation Program

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Page 7

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000012

Sample Delivery Group	WSCF20042380
Sample Matrix	Soil
Sample Visual	N/A
SAF Number	F04-015
Data Deliverable	Summary Report

Introduction

Two (2) 200-MW-1 Characterization Sampling and Analysis – Soil/216-U-3, 17.5' – 20', samples (B19939 and B19940) were received at the WSCF Laboratory on December 10, 2004. The samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Groundwater Remediation Program – Letter of Instruction*, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the Chain of Custody and Request for Sample Analysis forms are included as Attachment 3.

Analytical Methodology for Requested Analyses

Inorganic

- Anions by EPA Method 300. Analytical work was performed with no deviations to the approved method.
- Cyanide by EPA Method 600/R-94-111 300. Analytical work was performed with no deviations to the approved method.
- ICP-MS Metals by EPA Method 200.8. Analytical work was performed with no deviations to the approved method.
- Percent Solids by EPA Method 160.3. Analytical work was performed with no deviations to the approved method.
- pH by EPA Method 9045C. Analytical work was performed with no deviations to the approved method.

Organic

- PCB by EPA Method 8082. Analytical work was performed with no deviations to the approved method.

000013

- Semi-VOA by EPA Method 8270C. Analytical work was performed with no deviations to the approved method.
- TPH Diesel/Gas Range by WDOE Method NWTPH-Dx/Gx. Analytical work was performed with no deviations to the approved method.
- VOA by EPA Method 8260B. Analytical work was performed with no deviations to the approved method.

Radiochemistry

- All RadChem analyses (AEA (Plutonium, Americium and Uranium), GEA, Sr-89/90) were run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved method.

Inorganic Comments

Anions - The hold times for Nitrite and Nitrate analyses were not met. A Blank, Laboratory Control Sample, Duplicate, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See pages 13 through 14 for QC details.

Analytical Notes:

- Preparation Date: 06-jan-2005.
- Duplicate, Matrix Spike and Matrix Spike Duplicate QC samples were analyzed on sample# B19945 (SDG# 20042473, SAF# F04-015).
- Nitrate and Sulfate – Samples B19939 and B19940 results were B-flagged; the analyte was less than the reportable detection limit, but greater than or equal to the method detection limit.

All QC controls are within the established limits.

Cyanide- The hold time for this analysis was met. A Blank, Preparation Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See page 15 for QC details. All QC controls are within the established limits.

ICP-MS Metals – The hold time for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 16 through 21 for QC details. Analytical Notes:

- Preparation Date: 14-dec-2004.
- Spike Precision was evaluated on:
 - Uranium – Sample # B19939

000014

- Silver, Cadmium, Chromium, Copper, Mercury and Lead – Sample# B19974 (SDG# 20042382, SAF# F04-019).
- Copper, Mercury and Lead - The analytes detected in the associated preparation Blank sample were evaluated and there was no significant affect on the sample results.

All other QC controls are within the established limits.

Percent Solids – Analyzed for organic results correction.

pH – The hold times for this analysis was met. All internal laboratory controls were within established limits.

Organic Comments

- Sample results were moisture corrected and reported on a dry-weight basis.

PCB – The hold times for this analysis was met. A Blank, Duplicate, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 27 through 28 for QC details. Analytical Notes:

- Preparation Date: 13-dec-2004.
- Matrix Spike and Matrix Spike Duplicate QC samples were analyzed on sample# B19197 (SDG# 20042304, SAF# F03-025).
- Tetrachloro-m-xylene (surrogate) – Matrix Spike Duplicate and Laboratory Control Sample recoveries were below established laboratory limits and the matrix Relative Percent Difference exceeded established laboratory limits due to excessive blow down while concentration of the sample. The Decachlorobiphenyl and Aroclor-1254 recoveries were within established limits, so the sample B19939 and B19940 results were not flagged.

All other QC controls are within the established limits.

Semi-VOA – The hold times for this analysis was met. A Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 29 through 32 for QC details. Analytical Note:

- Preparation Date: 13-dec-2004.

All QC controls are within the established limits.

TPHD-WA-Diesel - The hold times for this analysis were met. A Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See page 33 for QC details. Analytical Note:

- Preparation Date: 13-dec-2004.

000015

All QC controls are within the established limits.

TPHD-WA-Gas - The hold times for this analysis were met. A Blank, Laboratory Control Sample, Duplicate Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See page 34 for QC details. Analytical Notes:

- Preparation Date: 15-dec-2004.
- Matrix Spike and Matrix Spike Duplicate QC samples were analyzed on sample# B19197 (SDG# 20042304, SAF# F03-025).
- Duplicate QC samples were analyzed on sample# B1B578 (SDG# 20042392, SAF# F03-006).
- Total Petroleum Hydrocarbons Gas – The Laboratory Control Sample recovery was below established laboratory limits. All other QC samples were within limits and the sample B19939 and B19940 results were not flagged.

All other QC controls are within the established limits.

VOA – The hold times for this analysis was met. A Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 35 through 37 for QC details. All QC controls are within the established limits.

Radiochemistry Comments

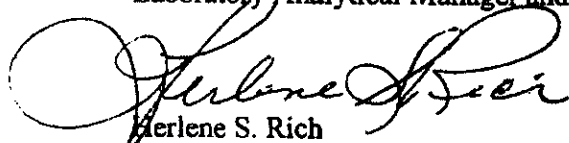
RadChem – There are no hold times associated with these WDOE accredited methods. A Blank, Laboratory Control Sample and Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 40 through 44 for QC details. All QC controls are within the established limits.

Radiochemical Tracer Percent Recovery			
Sample Number	Lab Sample ID	Isotope	Tracer Recovery (Percent)
BLANK		Pu-242	77.6
LCS		Pu-242	72.7
B19939	W040002581	Pu-242	66.8
DUPLICATE		Pu-242	75.2
B19940	W040002582	Pu-242	77.6

000016

Radiochemical Tracer Percent Recovery			
Sample Number	Lab Sample ID	Isotope	Tracer Recovery (Percent)
BLANK		Am-243	69.2
LCS		Am-243	99.3
B19939	W040002581	Am-243	90.1
DUPLICATE		Am-243	87.9
B19940	W040002582	Am-243	85.9
BLANK		Sr-85	96.0
LCS		Sr-85	94.6
B19939	W040002581	Sr-85	102.0
DUPLICATE		Sr-85	105.3
B19940	W040002582	Sr-85	93.1
BLANK		U-232	79.9
LCS		U-232	72.1
B19939	W040002581	U-232	77.5
DUPLICATE		U-232	85.1
B19940	W040002582	U-232	92.2

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.


 Terlene S. Rich
 WSCF Production Control

⁵ 000017

FLUOR Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						F04-015-043		PAGE 1 OF 1		
COLLECTOR Pope/Pfister/Hughes/WbergPope/Pfister/Tyrs/Wberg		COMPANY CONTACT CS Clearlock		TELEPHONE NO. 372-9638		PROJECT COORDINATOR TRENT, SJ		PRICE CODE 8N		DATA TURNAROUND		
SAMPLING LOCATION 216-U-3; 12-02-1651 17.5-2064 4/12/04		PROJECT DESIGNATION 200-MW-1 Characterization Sampling and Analysis - Soil				SAF NO. F04-015		AIR QUALITY <input type="checkbox"/>		45 Days / 45 Days		
ICE CHEST NO.		FIELD LOGBOOK NO. HNF-N-386 1		COA 119144ES10		METHOD OF SHIPMENT Government Vehicle						
SHIPPED TO Waste Sampling & Characterization		OFFSITE PROPERTY NO. N/A				BILL OF LADING/AIR BILL NO. N/A						
MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Seiment T=Tissue V=Vegetation W=Water WI=Wipe X=Other		POSSIBLE SAMPLE HAZARDS/ REMARKS N/A		PRESERVATION		Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	
				TYPE OF CONTAINER		gG	gG	gG	gG*	gG	Square Bottle - Poly	
				NO. OF CONTAINER(S)		1	1	1	3	1	1	
				VOLUME		250mL	120mL	250mL	40mL	120mL	500mL	
SPECIAL HANDLING AND/OR STORAGE Radioactive Tie To: B19951 20042380		SAMPLE ANALYSIS		SEE ITEM (1) IN SPECIAL INSTRUCTIONS	PCN - 802;	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	SEE ITEM (4) IN SPECIAL INSTRUCTIONS	SEE ITEM (5) IN SPECIAL INSTRUCTIONS	GEA		
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
B19939	SOIL W04002581	12/10/04	1050	X	X	X	X	X	X			
B19940	SOIL W04002582	12/10/04	1050	X	X	X	X	X	X			
CHAIN OF POSSESSION				SIGN/ PRINT NAMES				SPECIAL INSTRUCTIONS				
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME		** The laboratory is to report both kerosene and diesel range compounds from the WTPH-D analysis.				
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME		(1) IC Anions - 300.0 (Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate) Total Cyanide - 9010; pH (Soil) - 9045;				
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME		(2) ICP/MS - 200.8 (TAL) (Cadmium, Chromium, Copper, Silver) ICP/MS - 200.8 (Add-on) (Lead, Uranium) 200.8 HG - ICPMS (Mercury)				
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME		(3) VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Butanol, cis-1,2-Dichloroethylene, n-Butylbenzene, trans-1,2-Dichloroethylene)				
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME		(4) Semi-VOA - 8270A (Add-On) (Tributyl phosphate) TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D (Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range)				
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME		(5) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155) Isotopic Plutonium; Isotopic Uranium; Americium-241; Strontium-89,90 - Total Sr; GEA - Expedite 24 hr turn around 12/7/04				
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME						
LABORATORY SECTION	RECEIVED BY			TITLE				DATE/TIME				
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD			DISPOSED BY				DATE/TIME				

000018

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Appendix 5

Data Validation Supporting Documentation

000019

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT: 200-MW-1			DATA PACKAGE: 42380		
VALIDATOR: TLI		LAB: WSCF		DATE: 8/12/05	
			SDG: 42380		
ANALYSES PERFORMED					
<u>Anions/IC</u>	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	<u>pH</u>	NO ₃ /NO ₂
Sulfate	TDS	TKN	Phosphate	<u>Cyanide</u>	
SAMPLES/MATRIX					
B19939 B19940					
nitrate, nitrite + phosphate not validated per FH1					
SOIL					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? Yes No N/AInitial calibrations acceptable? Yes No N/AICV and CCV checks performed on all instruments? Yes No N/AICV and CCV checks acceptable? Yes No N/AStandards traceable? Yes No N/AStandards expired? Yes No N/ACalculation check acceptable? Yes No N/A

Comments: _____

000020

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E)..... Yes No ☒ N/A

ICB and CCB results acceptable? (Levels D, E)..... Yes No ☒ N/A

Laboratory blanks analyzed?..... Yes No N/A

Laboratory blank results acceptable?..... Yes No N/A

Field blanks analyzed? (Levels C, D, E)..... Yes No ☒ N/A

Field blank results acceptable? (Levels C, D, E)..... Yes No ☒ N/A

Transcription/calculation errors? (Levels D, E)..... Yes No ☒ N/A

Comments: no PD

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed?..... Yes No N/A

Spike recoveries acceptable?..... Yes No N/A

Sike standards NIST traceable? (Levels D, E)..... Yes No ☒ N/A

Spike standards expired? (Levels D, E)..... Yes No ☒ N/A

LCS/BSS samples analyzed?..... Yes No N/A

LCS/BSS results acceptable?..... Yes No N/A

Standards traceable? (Levels D, E)..... Yes No ☒ N/A

Standards expired? (Levels D, E)..... Yes No ☒ N/A

Transcription/calculation errors? (Levels D, E)..... Yes No ☒ N/A

Performance audit sample(s) analyzed?..... Yes No ☒ N/A

Performance audit sample results acceptable?..... Yes No ☒ N/A

Comments: no PAS

000021

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ☒ Yes No N/A

Duplicate results acceptable? ☒ Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) Yes No ☒ N/A

MS/MSD standards expired? (Levels D, E) ☒ Yes No ☒ N/A

Field duplicate RPD values acceptable? ☒ Yes No N/A

Field split RPD values acceptable? Yes No ☒ N/A

Transcription/calculation errors? (Levels D, E) Yes No ☒ N/A

Comments: _____

6. HOLDING TIMES (all levels)

Samples properly preserved? ☒ Yes No N/A

Sample holding times acceptable? ☒ Yes No N/A

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ☒ Yes ☐ No ☐ N/A
Results supported in the raw data? (Levels D, E) ☐ Yes ☐ No ☒ N/A
Samples properly prepared? (Levels D, E) ☐ Yes ☐ No ☒ N/A
Detection limits meet RDL? ☒ Yes ☐ No ☐ N/A
Transcription/calculation errors? (Levels D, E) ☐ Yes ☐ No ☒ N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

000024

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380
Matrix: SOLID
Test: Anions by Ion Chromatography

SAF Number: F04-015
Sample Date: 12/20/04
Receive Date: 12/20/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
Lab ID: W040002744 BATCH QC ASSOCIATED WITH SAMPLE									
DUP	Fluoride	18984-48-8	<1.15e0	n/a	RPD	01/05/05	0.000	20.000	U
DUP	Nitrogen in Nitrite	NO2-N	<9.50e-1	n/a	RPD	01/05/05	0.000	20.000	U
DUP	Nitrogen in Nitrate	NO3-N	2.16e+00	11.247	RPD	01/05/05	0.000	20.000	
DUP	Phosphate (P) by IC	PO4-P	<2.70e0	n/a	RPD	01/05/05	0.000	20.000	U
DUP	Sulfate	14808-79-8	<5.00e0	n/a	RPD	01/05/05	0.000	20.000	U
MS	Fluoride	18984-48-8	4.34e-01	87.854	% Recov	01/05/05	75.000	125.000	
MS	Nitrogen in Nitrite	NO2-N	4.83e-01	98.800	% Recov	01/05/05	75.000	125.000	
MS	Nitrogen in Nitrate	NO3-N	4.36e-01	98.674	% Recov	01/05/05	75.000	125.000	
MS	Phosphate (P) by IC	PO4-P	7.97e-01	82.250	% Recov	01/05/05	75.000	125.000	
MS	Sulfate	14808-79-8	1.85e+00	92.500	% Recov	01/05/05	75.000	125.000	
MSD	Fluoride	18984-48-8	4.56e-01	92.308	% Recov	01/05/05	75.000	125.000	
MSD	Nitrogen in Nitrite	NO2-N	4.70e-01	94.000	% Recov	01/05/05	75.000	125.000	
MSD	Nitrogen in Nitrate	NO3-N	4.56e-01	101.109	% Recov	01/05/05	75.000	125.000	
MSD	Phosphate (P) by IC	PO4-P	8.25e-01	85.139	% Recov	01/05/05	75.000	125.000	
MSD	Sulfate	14808-79-8	1.81e+00	90.500	% Recov	01/05/05	75.000	125.000	
BATCH QC									
BLANK	Fluoride	18984-48-8	<2.30e-2	n/a	mg/L	01/05/05	0.000	300.000	U
BLANK	Fluoride	18984-48-8	<2.30e-2	n/a	mg/L	01/05/05	0.000	300.000	U
BLANK	Fluoride	18984-48-8	<2.30e-2	n/a	mg/L	01/05/05	0.000	300.000	U
BLANK	Nitrogen in Nitrite	NO2-N	<1.90e-2	n/a	mg/L	01/05/05	0.000	300.000	U
BLANK	Nitrogen in Nitrite	NO2-N	<1.90e-2	n/a	mg/L	01/05/05	0.000	300.000	U
BLANK	Nitrogen in Nitrite	NO2-N	<1.90e-2	n/a	mg/L	01/05/05	0.000	300.000	U
BLANK	Nitrogen in Nitrate	NO3-N	<1.30e-2	n/a	mg/L	01/05/05	0.000	300.000	U
BLANK	Nitrogen in Nitrate	NO3-N	<1.30e-2	n/a	mg/L	01/05/05	0.000	300.000	U
BLANK	Nitrogen in Nitrate	NO3-N	<1.30e-2	n/a	mg/L	01/05/05	0.000	300.000	U

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380
 Matrix: SOLID
 Test: Anions by Ion Chromatography

SAF Number: F04-015
 Sample Date:
 Receive Date:

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
BLANK	Phosphate (P) by IC	PO4-P	<5.40e-2	n/a	mg/L	01/05/05	0.000	300.000	U
BLANK	Phosphate (P) by IC	PO4-P	<5.40e-2	n/a	mg/L	01/05/05	0.000	300.000	U
BLANK	Phosphate (P) by IC	PO4-P	<5.40e-2	n/a	mg/L	01/05/05	0.000	300.000	U
BLANK	Sulfate	14808-79-8	<1.00e-1	n/a	mg/L	01/05/05	0.000	300.000	U
BLANK	Sulfate	14808-79-8	<1.00e-1	n/a	mg/L	01/05/05	0.000	300.000	U
BLANK	Sulfate	14808-79-8	<1.00e-1	n/a	mg/L	01/05/05	0.000	300.000	U
LCS	Fluoride	16984-48-8	9.02e+01	91.388	% Recov	01/05/05	80.000	120.000	
LCS	Fluoride	16984-48-8	9.79e+01	99.189	% Recov	01/05/05	80.000	120.000	
LCS	Nitrogen in Nitrite	NO2-N	9.86e+01	98.600	% Recov	01/05/05	80.000	120.000	
LCS	Nitrogen in Nitrite	NO2-N	1.02e+02	102.000	% Recov	01/05/05	80.000	120.000	
LCS	Nitrogen in Nitrate	NO3-N	9.51e+01	105.549	% Recov	01/05/05	80.000	120.000	
LCS	Nitrogen in Nitrate	NO3-N	9.12e+01	101.221	% Recov	01/05/05	80.000	120.000	
LCS	Phosphate (P) by IC	PO4-P	1.94e+02	100.103	% Recov	01/05/05	80.000	120.000	
LCS	Phosphate (P) by IC	PO4-P	1.90e+02	98.039	% Recov	01/05/05	80.000	120.000	
LCS	Sulfate	14808-79-8	3.89e+02	97.494	% Recov	01/05/05	80.000	120.000	
LCS	Sulfate	14808-79-8	3.65e+02	96.491	% Recov	01/05/05	80.000	120.000	

000026

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380
 Matrix: SOLID
 Test: Cyanide by Midi/Spectrophotom

SAF Number: F04-015
 Sample Date: 12/10/04
 Receive Date: 12/10/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
Lab ID: W040002581									
BATCH QC ASSOCIATED WITH SAMPLE									
MS	Cyanide by Midi/Spectrophotom	57-12-5	100.2	100.200	% Recov	12/15/04	75.000	125.000	
MSD	Cyanide by Midi/Spectrophotom	57-12-5	90.2	90.200	% Recov	12/15/04	75.000	125.000	
SPK-RPD	Cyanide by Midi/Spectrophotom	57-12-5	90.200	10.504	RPD	12/15/04	0.000	20.000	
BATCH QC									
BLANK	Cyanide by Midi/Spectrophotom	57-12-5	1	1.000	ug/L	12/15/04	-4.000	4.000	
BLNK-PREP	Cyanide by Midi/Spectrophotom	57-12-5	1	1.000	ug/L	12/15/04	-4.000	4.000	
LCS	Cyanide by Midi/Spectrophotom	57-12-5	98.1	98.100	% Recov	12/15/04	85.000	115.000	

0000027

Date: 25 May 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-MW-1 Characterization Sampling and Analysis - Soil
Subject: Radiochemistry - Data Package No. WSCF20042380 (42380)



INTRODUCTION

This memo presents the results of data validation on Data Package No. 42380 prepared by WSCF Analytical Laboratories (WSCF). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B19939	12/10/04	Soil	C	See note 1
B19940	12/10/04	Soil	C	See note 1

1 - Strontium-90, gamma spectroscopy and alpha spectroscopy.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-MW-1 Miscellaneous Waste Group OU RI/FS Workplan, DOE/RL-2001-65 (Rev. 0), April 2002. Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

• Holding Times

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

000001

- **Laboratory (Method) Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the required detection limit (RDL), the following qualifiers are applied: All positive sample results less than or equal to five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the minimum detectable activity (MDA) are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

Due to the lack of a blank analysis, all plutonium-238, uranium-234 and uranium-235 results were qualified as estimates and flagged "J".

Due to method blank contamination, all americium-241 results were qualified as estimates and flagged "J".

Due to method blank contamination, the uranium-238 result in samples B19939 and B19940 were qualified as estimates and flagged "J".

All other laboratory blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample (LCS) and matrix spike (MS) recovery range is either 65-135% or 70-130%, depending on the analyte. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

Due to the lack of an LCS analysis, all plutonium-238, uranium-234 and uranium-235 results were qualified as estimates and flagged "J".

000002

All other accuracy results were acceptable.

- **Precision**

Analytical precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the contract required detection limit (CRDL) and the RPD is less than ± 35 percent, the results are acceptable. If either activities are less than five times the CRDL, a control limit of less than or equal to two times the CRDL is used for soil samples and less than or equal to the CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to the CRDL for water samples and less than or equal to two times the CRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to the lack of a duplicate analysis, all plutonium-238, uranium-234 and uranium-235 results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicates (B19939/B19940) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels are compared against the required target quantitation limits (RTQLs) to ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels met the analyte specific RTQL.

- **Completeness**

Data package SDG No. 42380 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

000003

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of a blank, duplicate and LCS analysis, all plutonium-238, uranium-234 and uranium-235 results were qualified as estimates and flagged "J". Due to method blank contamination, all americium-241 results were qualified as estimates and flagged "J". Due to method blank contamination, the uranium-238 result in samples B19939 and B19940 were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the FHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2001-65, Rev. 0, *200-MW-1 Miscellaneous Waste Group OUs RI/FS Work Plan*, April 2002.

000004

Appendix 1
Glossary of Data Reporting Qualifiers

000005

Qualifiers which may be applied by data validators in compliance with the FHI statement of work are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.
- UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

000006

Appendix 2
Summary of Data Qualification

000007

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: 42380	REVIEWER: TLI	DATE: 5/25/05	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Plutonium-238 Uranium-233/234 Uranium-235	J	All	No LCS, duplicate or blank analysis
Uranium-238	J	B19940, B19939	Blank contamination
Americium-241	J	All	Blank contamination

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

000008

Appendix 3
Qualified Data Summary and Annotated Laboratory Reports

000009

Project: FLUOR-HANFORD					
Laboratory: WSCF					
Case		SDG: WSCF20042380			
Sample Number		B19939		B19940	
Remarks				Duplicate	
Sample Date		12/10/04		12/10/04	
Radiochemistry	RTQI	Result	Q	Result	Q
Americium-241	1	0.0360	J	0.0280	J
Cobalt-60	0.05	0.000501	U	0.00330	U
Cesium-137	0.1	-0.000336	U	0.00412	U
Europium 152	0.1	-0.00958	U	0.0000927	U
Europium 154	0.1	0.00286	U	0.0238	U
Europium 155	0.1	0.0237		0.0336	U
Plutonium-238	1	-0.0110	UJ	-0.00610	UJ
Plutonium-239/240	1	0.00850	U	0.00200	U
Strontium-89/90	1	0.0160	U	0.130	U
Uranium-233/234	1	0.120	J	0.130	J
Uranium-235	1	0.0160	J	0.0110	UJ
Uranium-238	1	0.140	J	0.120	J

000010

* - TDL exceeded

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize potential miss-interpretation of results. All other qualifiers shown were applied during validation.

WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F04-015: F04-015

Group #: WSCF20042380

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
Radiochemistry														
W040002581	B19939	TRENT	14596-10-2	Americium-241	SOIL	LA-508-471	<i>YJS</i>	0.0360	pCi/g	1.00	0.013	01/05/05	12/10/04	12/10/04
W040002581	B19939	TRENT	E,T,C	Am-241 by AEA Total Cntg Error	SOIL	LA-508-471	<i>YJS</i>	+ 0.017	pCi/g	1.00	0.0	01/05/05	12/10/04	12/10/04
W040002581	B19939	TRENT	10198-40-0	Cobalt-60	SOIL	LA-508-481	U	5.01e-04	pCi/g	1.00	8.2e-03	12/14/04	12/10/04	12/10/04
W040002581	B19939	TRENT	E,T,C	Co-60 Rel. Count Error (GEA)	SOIL	LA-508-481		+ 4.7e-03	pCi/g	1.00	0.0	12/14/04	12/10/04	12/10/04
W040002581	B19939	TRENT	10045-97-3	Cesium-137	SOIL	LA-508-481	U	-3.36e-04	pCi/g	1.00	8.2e-03	12/14/04	12/10/04	12/10/04
W040002581	B19939	TRENT	E,T,C	Cs-137 Rel. Count Error (GEA)	SOIL	LA-508-481		+ 3.4e-03	pCi/g	1.00	0.0	12/14/04	12/10/04	12/10/04
W040002581	B19939	TRENT	14683-23-9	Europium-152	SOIL	LA-508-481	U	-9.58e-03	pCi/g	1.00	0.025	12/14/04	12/10/04	12/10/04
W040002581	B19939	TRENT	E,T,C	Eu-152 Rel. Count Error (GEA)	SOIL	LA-508-481		+ 0.016	pCi/g	1.00	0.0	12/14/04	12/10/04	12/10/04
W040002581	B19939	TRENT	15586-10-1	Europium-154	SOIL	LA-508-481	U	2.86e-03	pCi/g	1.00	0.026	12/14/04	12/10/04	12/10/04
W040002581	B19939	TRENT	E,T,C	Eu-154 Rel. Count Error (GEA)	SOIL	LA-508-481		+ 0.017	pCi/g	1.00	0.0	12/14/04	12/10/04	12/10/04
W040002581	B19939	TRENT	14391-16-3	Europium-155	SOIL	LA-508-481		0.0237	pCi/g	1.00	0.036	12/14/04	12/10/04	12/10/04
W040002581	B19939	TRENT	E,T,C	Eu-155 Rel. Count Error (GEA)	SOIL	LA-508-481		+ 0.028	pCi/g	1.00	0.0	12/14/04	12/10/04	12/10/04
W040002581	B19939	TRENT	13981-16-3	Plutonium-238	SOIL	LA-508-471	U <i>J</i>	-0.0110	pCi/g	1.00	0.065	01/05/05	12/10/04	12/10/04
W040002581	B19939	TRENT	E,T,C	Pu-238 by AEA Total Cntg Error	SOIL	LA-508-471		+ 0.036	pCi/g	1.00	0.0	01/05/05	12/10/04	12/10/04
W040002581	B19939	TRENT	PU-239/240	Pu-239/240 by AEA	SOIL	LA-508-471	U <i>X</i>	8.50e-03	pCi/g	1.00	0.020	01/05/05	12/10/04	12/10/04
W040002581	B19939	TRENT	E,T,C	Pu-239/240 AEA Total Cntg Err	SOIL	LA-508-471		+ 0.012	pCi/g	1.00	0.0	01/05/05	12/10/04	12/10/04
W040002581	B19939	TRENT	SR-RAD	Strontium-89/90	SOIL	LA-508-415	U <i>X</i>	0.0160	pCi/g	1.00	0.20	01/04/05	12/10/04	12/10/04
W040002581	B19939	TRENT	E,T,C	Sr-89/90 Rel. Count Error	SOIL	LA-508-415		+ 0.16	pCi/g	1.00	0.0	01/04/05	12/10/04	12/10/04
W040002581	B19939	TRENT	U-233/234	Uranium-233/234	SOIL	LA-508-471	<i>J</i>	0.120	pCi/g	1.00	0.017	01/05/05	12/10/04	12/10/04
W040002581	B19939	TRENT	E,T,C	U-233/234 AEA Total Cntg Error	SOIL	LA-508-471		+ 0.042	pCi/g	1.00	0.0	01/05/05	12/10/04	12/10/04
W040002581	B19939	TRENT	15117-96-1	Uranium-235	SOIL	LA-508-471	<i>J</i>	0.0160	pCi/g	1.00	5.3e-03	01/05/05	12/10/04	12/10/04
W040002581	B19939	TRENT	E,T,C	U-235 by AEA Total Cntg Error	SOIL	LA-508-471		+ 0.012	pCi/g	1.00	0.0	01/05/05	12/10/04	12/10/04
W040002581	B19939	TRENT	U-238	Uranium-238	SOIL	LA-508-471	<i>J X</i>	0.140	pCi/g	1.00	4.9e-03	01/05/05	12/10/04	12/10/04
W040002581	B19939	TRENT	E,T,C	U-238 by AEA Total Cntg Error	SOIL	LA-508-471		+ 0.048	pCi/g	1.00	0.10	01/05/05	12/10/04	12/10/04
W040002582	B19940	TRENT	14596-10-2	Americium-241	SOIL	LA-508-471	<i>YJS</i>	0.0280	pCi/g	1.00	0.013	01/05/05	12/10/04	12/10/04
W040002582	B19940	TRENT	E,T,C	Am-241 by AEA Total Cntg Error	SOIL	LA-508-471	<i>YJS</i>	+ 0.015	pCi/g	1.00	0.0	01/05/05	12/10/04	12/10/04

MDL = Minimum Detection Limit
RQ = Result Qualifier

B - The analyte < the RDL but > = the IDL/MDL (inorganic)

U - Analyzed for but not detected above limiting criteria.

DF = Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

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Groundwater Remediation Program

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WSCF

ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F04-015: F04-015

Group #: WSCF20042380

					WSCF									
Sample #	Client ID		CAS #	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W040002582	B19940	TRENT	10198-40-0	Cobalt-60	SOIL	LA-508-481	U	3.30e-03	pCi/g	1.00	0.015	12/13/04	12/10/04	12/10/04
W040002582	B19940	TRENT	E,T,C	Co-60 Rel. Count Error (GEA)	SOIL	LA-508-481		+ 8.2e-03	pCi/g	1.00	0.0	12/13/04	12/10/04	12/10/04
W040002582	B19940	TRENT	10045-97-3	Cesium-137	SOIL	LA-508-481	U	4.12e-03	pCi/g	1.00	0.016	12/13/04	12/10/04	12/10/04
W040002582	B19940	TRENT	E,T,C	Cs-137 Rel. Count Error (GEA)	SOIL	LA-508-481		+ 0.010	pCi/g	1.00	0.0	12/13/04	12/10/04	12/10/04
W040002582	B19940	TRENT	14683-23-9	Europium-152	SOIL	LA-508-481	U	9.27e-05	pCi/g	1.00	0.042	12/13/04	12/10/04	12/10/04
W040002582	B19940	TRENT	E,T,C	Eu-152 Rel. Count Error (GEA)	SOIL	LA-508-481		+ 9.3e-04	pCi/g	1.00	0.0	12/13/04	12/10/04	12/10/04
W040002582	B19940	TRENT	15585-10-1	Europium-154	SOIL	LA-508-481	U	0.0238	pCi/g	1.00	0.051	12/13/04	12/10/04	12/10/04
W040002582	B19940	TRENT	E,T,C	Eu-154 Rel. Count Error (GEA)	SOIL	LA-508-481		+ 0.029	pCi/g	1.00	0.0	12/13/04	12/10/04	12/10/04
W040002582	B19940	TRENT	14391-16-3	Europium-155	SOIL	LA-508-481	U	0.0336	pCi/g	1.00	0.050	12/13/04	12/10/04	12/10/04
W040002582	B19940	TRENT	E,T,C	Eu-155 Rel. Count Error (GEA)	SOIL	LA-508-481		+ 0.029	pCi/g	1.00	0.0	12/13/04	12/10/04	12/10/04
W040002582	B19940	TRENT	13981-16-3	Plutonium-238	SOIL	LA-508-471	U J	-6.10e-03	pCi/g	1.00	0.043	01/05/05	12/10/04	12/10/04
W040002582	B19940	TRENT	E,T,C	Pu-238 by AEA Total Cntg Error	SOIL	LA-508-471		+ 0.022	pCi/g	1.00	0.0	01/05/05	12/10/04	12/10/04
W040002582	B19940	TRENT	PU-239/240	Pu-238/240 by AEA	SOIL	LA-508-471	U <i>Handwritten</i>	2.00e-03	pCi/g	1.00	0.015	01/05/05	12/10/04	12/10/04
W040002582	B19940	TRENT	E,T,C	Pu-239/240 AEA Total Cntg Err	SOIL	LA-508-471		+ 7.0e-03	pCi/g	1.00	0.0	01/05/05	12/10/04	12/10/04
W040002582	B19940	TRENT	SR-RAD	Strontium-89/90	SOIL	LA-508-415	U <i>Handwritten</i>	0.130	pCi/g	1.00	0.20	01/04/05	12/10/04	12/10/04
W040002582	B19940	TRENT	E,T,C	Sr-89/90 Rel. Count Error	SOIL	LA-508-415		+ 0.40	pCi/g	1.00	0.0	01/04/05	12/10/04	12/10/04
W040002582	B19940	TRENT	U-233/234	Uranium-233/234	SOIL	LA-508-471	J	0.130	pCi/g	1.00	4.6e-03	01/05/05	12/10/04	12/10/04
W040002582	B19940	TRENT	E,T,C	U-233/234 AEA Total Cntg Error	SOIL	LA-508-471		+ 0.044	pCi/g	1.00	0.0	01/05/05	12/10/04	12/10/04
W040002582	B19940	TRENT	15117-96-1	Uranium-235	SOIL	LA-508-471	U J	0.0110	pCi/g	1.00	0.014	01/05/05	12/10/04	12/10/04
W040002582	B19940	TRENT	E,T,C	U-235 by AEA Total Cntg Error	SOIL	LA-508-471		+ 0.011	pCi/g	1.00	0.0	01/05/05	12/10/04	12/10/04
W040002582	B19940	TRENT	U-238	Uranium-238	SOIL	LA-508-471	J <i>Handwritten</i>	0.120	pCi/g	1.00	4.6e-03	01/05/05	12/10/04	12/10/04
W040002582	B19940	TRENT	E,T,C	U-238 by AEA Total Cntg Error	SOIL	LA-508-471	<i>Handwritten</i>	+ 0.042	pCi/g	1.00	0.10	01/05/05	12/10/04	12/10/04

MDL = Minimum Detection Limit
RQ = Result Qualifier

B - The analyte < the RDL but > = the IDL/MDL (inorganic)

U - Analyzed for but not detected above limiting criteria.

DF = Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

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Groundwater Remediation Program

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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Sample Delivery Group	WSCF20042380
Sample Matrix	Soil
Sample Visual	N/A
SAF Number	F04-015
Data Deliverable	Summary Report

Introduction

Two (2) 200-MW-1 Characterization Sampling and Analysis – Soil/216-U-3, 17.5' – 20', samples (B19939 and B19940) were received at the WSCF Laboratory on December 10, 2004. The samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Groundwater Remediation Program – Letter of Instruction*, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the Chain of Custody and Request for Sample Analysis forms are included as Attachment 3.

Analytical Methodology for Requested Analyses

Inorganic

- Anions by EPA Method 300. Analytical work was performed with no deviations to the approved method.
- Cyanide by EPA Method 600/R-94-111 300. Analytical work was performed with no deviations to the approved method.
- ICP-MS Metals by EPA Method 200.8. Analytical work was performed with no deviations to the approved method.
- Percent Solids by EPA Method 160.3. Analytical work was performed with no deviations to the approved method.
- pH by EPA Method 9045C. Analytical work was performed with no deviations to the approved method.

Organic

- PCB by EPA Method 8082. Analytical work was performed with no deviations to the approved method.

- Semi-VOA by EPA Method 8270C. Analytical work was performed with no deviations to the approved method.
- TPH Diesel/Gas Range by WDOE Method NWTPH-Dx/Gx. Analytical work was performed with no deviations to the approved method.
- VOA by EPA Method 8260B. Analytical work was performed with no deviations to the approved method.

Radiochemistry

- All RadChem analyses (AEA (Plutonium, Americium and Uranium), GEA, Sr-89/90) were run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved method.

Inorganic Comments

Anions - The hold times for Nitrite and Nitrate analyses were not met. A Blank, Laboratory Control Sample, Duplicate, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See pages 13 through 14 for QC details.

Analytical Notes:

- Preparation Date: 06-jan-2005.
- Duplicate, Matrix Spike and Matrix Spike Duplicate QC samples were analyzed on sample# B19945 (SDG# 20042473, SAF# F04-015).
- Nitrate and Sulfate – Samples B19939 and B19940 results were B-flagged; the analyte was less than the reportable detection limit, but greater than or equal to the method detection limit.

All QC controls are within the established limits.

Cyanide- The hold time for this analysis was met. A Blank, Preparation Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See page 15 for QC details. All QC controls are within the established limits.

ICP-MS Metals – The hold time for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 16 through 21 for QC details. Analytical Notes:

- Preparation Date: 14-dec-2004.
- Spike Precision was evaluated on:
 - Uranium – Sample # B19939

- Silver, Cadmium, Chromium, Copper, Mercury and Lead – Sample# B19974 (SDG# 20042382, SAF# F04-019).
- Copper, Mercury and Lead - The analytes detected in the associated preparation Blank sample were evaluated and there was no significant affect on the sample results.

All other QC controls are within the established limits.

Percent Solids – Analyzed for organic results correction.

pH – The hold times for this analysis was met. All internal laboratory controls were within established limits.

Organic Comments

- Sample results were moisture corrected and reported on a dry-weight basis.

PCB – The hold times for this analysis was met. A Blank, Duplicate, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 27 through 28 for QC details. Analytical Notes:

- Preparation Date: 13-dec-2004.
- Matrix Spike and Matrix Spike Duplicate QC samples were analyzed on sample# B19197 (SDG# 20042304, SAF# F03-025).
- Tetrachloro-m-xylene (surrogate) – Matrix Spike Duplicate and Laboratory Control Sample recoveries were below established laboratory limits and the matrix Relative Percent Difference exceeded established laboratory limits due to excessive blow down while concentration of the sample. The Decachlorobiphenyl and Aroclor-1254 recoveries were within established limits, so the sample B19939 and B19940 results were not flagged.

All other QC controls are within the established limits.

Semi-VOA – The hold times for this analysis was met. A Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 29 through 32 for QC details. Analytical Note:

- Preparation Date: 13-dec-2004.

All QC controls are within the established limits.

TPHD-WA-Diesel - The hold times for this analysis were met. A Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See page 33 for QC details. Analytical Note:

- Preparation Date: 13-dec-2004.

All QC controls are within the established limits.

TPHD-WA-Gas - The hold times for this analysis were met. A Blank, Laboratory Control Sample, Duplicate Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See page 34 for QC details. Analytical Notes:

- Preparation Date: 15-dec-2004.
- Matrix Spike and Matrix Spike Duplicate QC samples were analyzed on sample# B19197 (SDG# 20042304, SAF# F03-025).
- Duplicate QC samples were analyzed on sample# B1B578 (SDG# 20042392, SAF# F03-006).
- Total Petroleum Hydrocarbons Gas – The Laboratory Control Sample recovery was below established laboratory limits. All other QC samples were within limits and the sample B19939 and B19940 results were not flagged.

All other QC controls are within the established limits.

VOA – The hold times for this analysis was met. A Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 35 through 37 for QC details. All QC controls are within the established limits.

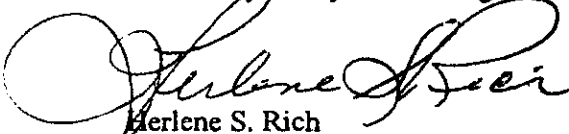
Radiochemistry Comments

RadChem – There are no hold times associated with these WDOE accredited methods. A Blank, Laboratory Control Sample and Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 40 through 44 for QC details. All QC controls are within the established limits.

Radiochemical Tracer Percent Recovery			
Sample Number	Lab Sample ID	Isotope	Tracer Recovery (Percent)
BLANK		Pu-242	77.6
LCS		Pu-242	72.7
B19939	W040002581	Pu-242	66.8
DUPLICATE		Pu-242	75.2
B19940	W040002582	Pu-242	77.6

Radiochemical Tracer Percent Recovery			
Sample Number	Lab Sample ID	Isotope	Tracer Recovery (Percent)
BLANK		Am-243	69.2
LCS		Am-243	99.3
B19939	W040002581	Am-243	90.1
DUPLICATE		Am-243	87.9
B19940	W040002582	Am-243	85.9
BLANK		Sr-85	96.0
LCS		Sr-85	94.6
B19939	W040002581	Sr-85	102.0
DUPLICATE		Sr-85	105.3
B19940	W040002582	Sr-85	93.1
BLANK		U-232	79.9
LCS		U-232	72.1
B19939	W040002581	U-232	77.5
DUPLICATE		U-232	85.1
B19940	W040002582	U-232	92.2

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.


Herlene S. Rich
WSCF Production Control

FLUOR Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				FOA-015-045	PAGE 1 OF 1
COLLECTOR Pope/Plaster/Hughes/Wiberg/Pope/Plaster/Tyra/Wiberg	COMPANY CONTACT CS Carlock	TELEPHONE NO. 372-9638	PROJECT COORDINATOR TRENT, SJ		PRICE CODE 8N	DATA TURNAROUND 45 Days / 45 Days	
SAMPLING LOCATION 216-U-3; 216-CL-17.5 - 20.5 ft 12/7/04	PROJECT DESIGNATION 200-MW-1 Characterization Sampling and Analysis - Soil	SAF NO. FOA-015		AIR QUALITY <input type="checkbox"/>			
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-386.1	COA 119144ES10	METHOD OF SHIPMENT Government Vehicle				
SHIPPED TO Waste Sampling & Characterization	OFFSITE PROPERTY NO. N/A	BILL OF LADING/AIR BILL NO. N/A					
POTENTIAL SAMPLE HAZARDS/REMARKS N/A	PRESERVATION	Cool AC	Cool AC	Cool AC	Cool AC	None	
MATRIX* A=Air DL=Drum L=Liquid DS=Drum S=Solid L=Liquid O=Oil S=Soil S=Soil T=Thane V=Vegetation W=Water X=Other	TYPE OF CONTAINER	4G	4G	4G	4G	Square Bottle - Poly	
NO. OF CONTAINER(S)		1	1	1	1	1	
VOLUME		250mL	120mL	250mL	40mL	500mL	
SPECIAL HANDLING AND/OR STORAGE Radioactive Tie To: B10951	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	POW - HEC	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	SEE ITEM (5) IN SPECIAL INSTRUCTIONS	
20047380						SEA	
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B19839	SOIL W04002581	12/10/04	1050	X	X	X	
B19940	SOIL W04002582	12/10/04	1050	X	X	X	
CHAIN OF POSSESSION		SIGN/PRINT NAMES		SPECIAL INSTRUCTIONS			
RELINQUISHED BY/REMOVED FROM <i>John Wiley</i>	DATE/TIME 12/10/04	RECEIVED BY/STORED IN <i>P. Boeb</i>	DATE/TIME 12/10/04	** The laboratory is to report both kerosene and diesel range compounds from the WTPH-D analysis.			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	(1)JC Arions - 300.0 (Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrate, Phosphate, Sulfate) Total Cyanide - 90.10; pH (Soil) - 9.045;			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	(2)ICP/MS - 200.8 (TAL) (Cadmium, Chromium, Copper, Silver) ICP/MS - 200.8 (Add-on) (Lead, Uranium) 200.8 HG - ICP/MS (Methylene)			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	(3)VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Butanol, cis-1,2-Dichloroethylene, n-Butylbenzene, trans-1,2-Dichloroethylene)			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	(4)Semi-VOA - 8270A (Add-On) (Tributyl phosphate) TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D (Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range)			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	(5)Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155) Isotopic Uranium; Isotopic Uranium; Americium-241; Strontium-89,90 -- Total Sr; SEA - Expedite 24 hr turn around 12/7/04			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	TITLE			
LABORATORY SECTION	RECEIVED BY	DISPOSAL METHOD		DATE/TIME			
FINAL SAMPLE DISPOSITION	DISPOSED BY			DATE/TIME			

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Appendix 5

Data Validation Supporting Documentation

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APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-MW-1			DATA PACKAGE: 42380		
VALIDATOR: FLI		LAB: WXP		DATE: 5/12/05	
			SDG: 42380		
ANALYSES PERFORMED					
Gross Alpha/Beta	<u>Strontium-90</u>	Technetium-99	<u>Alpha Spectroscopy</u>	<u>Gamma Spectroscopy</u>	
Total Uranium	Radium-22	Tritium			
SAMPLES/MATRIX					
B19939 D19940					

1. Completeness ☐ N/A

Technical verification forms present?..... Yes No N/A

Comments:

2. Initial Calibration (Levels D, E) ☒ N/A

Instruments/detectors calibrated?.....Yes No N/A

Initial calibration acceptable? Yes No N/A

Standards NIST traceable?.....Yes No N/A

Standards Expired? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments:

3. Continuing Calibration (Levels D, E)

☒ N/A

Calibration checked within required frequency? Yes No N/A

Calibration check acceptable? Yes No N/A

Calibration check standards traceable? Yes No N/A

Calibration check standards expired? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

4. Background Counts (Levels D, E)

☒ N/A

Background Counts checked within required frequency? Yes No N/A

Background Counts acceptable? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

5. Blanks (Levels B, C, D, E) ☐ N/A

Method blank analyzed within required frequency? Yes ☒ No ☐ N/A

Method blank results acceptable? Yes ☒ No ☐ N/A

Analytes detected in method blank? ☒ Yes ☐ No ☐ N/A

Field blank(s) analyzed? Yes ☒ No ☐ N/A

Field blank results acceptable? Yes ☐ No ☒ N/A

Analytes detected in field blank(s)? Yes ☐ No ☒ N/A

Transcription/Calculation Errors? (Levels D, E) Yes ☐ No ☒ N/A

Comments: no Pu-238, U235 or U235/34 blank - Tall

MB - Am241 - UJ all

po 238/40 - UJ all

SR 87/90 - UJ all

U238 - J 40 + 39 no FB

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) ☐ N/A

LCS /BSS analyzed within required frequency? Yes ☒ No ☐ N/A

LCS/BSS recoveries acceptable? ☒ Yes ☐ No ☐ N/A

LCS/BSS traceable? (Levels D,E) Yes ☐ No ☒ N/A

LCS/BSS expired? (Levels D,E) Yes ☐ No ☒ N/A

LCS/BSS levels correct? (Levels D,E) Yes ☐ No ☒ N/A

Transcription/Calculation Errors? (Levels D, E) Yes ☐ No ☒ N/A

Comments: no Pu238, U235 or U235/34 LCS Tall

7. Chemical Carrier Recovery (Levels C, D, E) ☒ N/A

Chemical carrier added? Yes ☐ No ☒ N/A

Chemical recovery acceptable? Yes ☐ No ☒ N/A

Chemical carrier traceable? (Levels D, E) Yes ☐ No ☒ N/A

000023

Chemical carrier expired? (Levels D, E) Yes No ☒ N/A

Transcription/Calculation errors? (Levels D, E) Yes No ☒ N/A

Comments: _____

8. Tracer Recovery (Levels C, D, E) ☐ N/A

Tracer added? ☒ Yes ☐ No ☐ N/A

Tracer recovery acceptable? ☒ Yes ☐ No ☐ N/A

Tracer traceable? (Levels D, E) ☒ Yes ☐ No ☐ N/A

Tracer expired? (Levels D, E) ☒ Yes ☐ No ☐ N/A

Transcription/Calculation errors? (Levels D, E) ☒ Yes ☐ No ☐ N/A

Comments: _____

9. Matrix Spikes (Levels C, D, E) ☒ N/A

Matrix spike analyzed? ☐ Yes ☐ No ☐ N/A

Spike recoveries acceptable? ☐ Yes ☐ No ☐ N/A

Spike source traceable? (Levels D, E) ☐ Yes ☐ No ☐ N/A

Spike source expired? Levels D, E) ☐ Yes ☐ No ☐ N/A

Transcription/Calculation Errors? (Levels D, E) ☐ Yes ☐ No ☐ N/A

Comments: _____

not used per FBI

10. Duplicates (Levels C, D, E) ☐ N/A

Duplicates Analyzed at required frequency? Yes ☒ No ☐ N/A

RPD Values Acceptable? ☒ Yes ☐ No ☐ N/A

Transcription/Calculation Errors? (Levels D, E) Yes ☐ No ☒ N/A

Comments: No P0235, 0235 or 0233/24 Aug - J al

11. Field QC Samples (Levels C, D E) ☐ N/A

Field duplicate sample(s) analyzed? ☒ Yes ☐ No ☐ N/A

Field duplicate RPD values acceptable? ☒ Yes ☐ No ☐ N/A

Field split sample(s) analyzed? Yes ☐ No ☒ N/A

Field split RPD values acceptable? Yes ☐ No ☒ N/A

Performance audit sample(s) analyzed? Yes ☒ No ☐ N/A

Performance audit sample results acceptable? Yes ☐ No ☒ N/A

Comments: No F0234 PS

12. Holding Times (All levels)

Are sample holding times acceptable? ☒ Yes ☐ No ☐ N/A

Comments: _____

13. Results and Detection Limits (All Levels)..... ☐ N/A

Results reported for all required sample analyses?..... ☒ Yes No ☐ N/A

Results supported in raw data?(Levels D, E)..... Yes No ☒ N/A

Results Acceptable? (Levels D, E) Yes No ☒ N/A

Transcription/Calculation errors? (Levels D, E)..... Yes No ☒ N/A

MDA's meet required detection limits? ☒ Yes No ☐ N/A

Transcription/calculation errors? (Levels D, E)..... Yes No ☒ N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

000027

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380
Matrix: SOLID
Test: Americium by AEA

SAF Number: F04-015
Sample Date: 12/10/04
Receive Date: 12/10/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
Lab ID: W040002581									
BATCH QC ASSOCIATED WITH SAMPLE									
DUP	Americium-241	14596-10-2	3.2e-02	11.765	RPD	01/05/05	0.000	20.000	
BATCH QC									
BLANK	Americium-241	14596-10-2	3.5e-02	0.035	pCi/g	01/05/05	-10.000	1000.000	
LCS	Americium-241	14596-10-2	4.7e+01	97.713	% Recov	01/05/05	75.000	125.000	

000028

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380
Matrix: SOLID
Test: Gamma Energy Analysis-grd H2O

SAF Number: F04-015
Sample Date: 12/10/04
Receive Date: 12/10/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
Lab ID: W040002581									
BATCH QC ASSOCIATED WITH SAMPLE									
DUP	Cobalt-60	10198-40-0	U1.98e-03	n/a	RPD	12/14/04	0.000	20.000	
DUP	Cesium-137	10045-97-3	U-2.26e-3	n/a	RPD	12/14/04	0.000	20.000	
DUP	Europium-152	14683-23-9	U-1.24e-2	n/a	RPD	12/14/04	0.000	20.000	
DUP	Europium-154	15585-10-1	U-7.82e-3	n/a	RPD	12/14/04	0.000	20.000	
DUP	Europium-155	14391-16-3	2.88e-02	19.429	RPD	12/14/04	0.000	20.000	
BATCH QC									
BLANK	Cobalt-60	10198-40-0	U7.59e-5	n/a	pCi/g	12/13/04	-10.000	1000.000	
BLANK	Cesium-137	10045-97-3	U-3.0e-3	n/a	pCi/g	12/13/04	-10.000	1000.000	
BLANK	Europium-152	14683-23-9	U4.15e-3	n/a	pCi/g	12/13/04	-10.000	1000.000	
BLANK	Europium-154	15585-10-1	U4.16e-3	n/a	pCi/g	12/13/04	-10.000	1000.000	
BLANK	Europium-155	14391-16-3	U7.97e-3	n/a	pCi/g	12/13/04	-10.000	1000.000	
LCS	Cobalt-60	10198-40-0	4.36e+03	104.057	% Recov	12/13/04	80.000	120.000	
LCS	Cesium-137	10045-97-3	3.82e+03	106.704	% Recov	12/13/04	80.000	120.000	

000029

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380
 Matrix: SOLID
 Test: Plutonium Isotopics by AEA

SAF Number: F04-015
 Sample Date: 12/10/04
 Receive Date: 12/10/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
Lab ID: W040002581									
BATCH QC ASSOCIATED WITH SAMPLE									
DUP	Pu-239/240 by AEA	PU-239/240	1.6e-02	n/a	RPD	01/05/05	0.000	20.000	
BATCH QC									
BLANK	Pu-239/240 by AEA	PU-239/240	6.4e-03	0.006	pCi/g	01/05/05	-10.000	1000.000	
LCS	Pu-239/240 by AEA	PU-239/240	4.7e+01	95.528	% Recov	01/05/05	75.000	125.000	

000030

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380
Matrix: SOLID
Test: Strontium 89/90

SAF Number: F04-015
Sample Date: 12/10/04
Receive Date: 12/10/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
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Lab ID: W040002581

BATCH QC ASSOCIATED WITH SAMPLE

DUP	Strontium-89/90	SR-RAD	U4.1E-02	n/a	RPD	01/04/05	0.000	20.000	
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BATCH QC

BLANK	Strontium-89/90	10098-97-2	4.2e-02	0.042	pCi/g	01/04/05	-10.000	300.000	
LCS	Strontium-89/90	10098-97-2	76.7	107.876	% Recov	01/04/05	80.000	120.000	

000031

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380
Matrix: SOLID
Test: Uranium Isotopics by AEA

SAF Number: F04-015
Sample Date: 12/10/04
Receive Date: 12/10/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
Lab ID: W040002581									
BATCH QC ASSOCIATED WITH SAMPLE									
DUP	Uranium-238	U-238	1.2e-01	15.385	RPD	01/05/05	0.000	20.000	
BATCH QC									
BLANK	Uranium-238	24678-82-8	2.8e-02	0.028	pCi/g	01/05/05	-10.000	1000.000	
LCS	Uranium-238	24678-82-8	8.1e+01	106.832	% Recov	01/05/05	75.000	125.000	

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Date: 25 May 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-MW-1 Characterization Sampling and Analysis - Soil
Subject: PCB - Data Package No.WSCF20042380 (42380)



INTRODUCTION

This memo presents the results of data validation on Data Package No. 42380 prepared by WSCF Analytical Laboratories. (WSCF). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B19939	12/10/04	Soil	C	PCBs by 8082
B19940	12/10/04	Soil	C	PCBs by 8082

Data validation was conducted in accordance with the FHI validation statement of work and the 200-MW-1 Miscellaneous Waste Group OU RI/FS Workplan, DOE/RL-2001-65 (Rev. 0), April 2002. Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

• Holding Times/Sample Preservation

Sample data were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 14 days of the date of sample collection.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

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All holding times were acceptable.

- **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than minimum detectable activity (MDA). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than MDA, the result is qualified as undetected and elevated to the MDA.

All method blank target compound results were acceptable.

Field Blanks

No equipment blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Blank Spike

Matrix spike and blank spike analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations and is done in duplicate. Matrix spike and blank spike analyses must be within control limits of 50% to 150%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All matrix spike/blank spike results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected

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compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 35%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (B19939/B19940) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required target quantitation limits (RTQL) to ensure that laboratory detection levels meet the required criteria. All results exceeded the analyte specific RTQL. Under the FHI statement of work, no qualification is required.

- **Completeness**

Data Package No. 42380 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

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MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

All results exceeded the analyte specific RTQL. Under the FHI statement of work, no qualification is required.

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2001-65, Rev. 0, *200-MW-1 Miscellaneous Waste Group OUs RI/FS Work Plan*, April 2002.

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Appendix 1

Glossary of Data Reporting Qualifiers

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Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

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Appendix 2
Summary of Data Qualification

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PCB DATA QUALIFICATION SUMMARY*

SDG: 42380	REVIEWER: TLI	DATE: 5/25/05	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Page 1 of 1

Project: FLUOR-HANFORD					
Laboratory: WSCF					
Case:		SDG: WSCF20042380			
Sample Number		B19939		B19940	
Remarks				Duplicate	
Sample Date		12/10/04		12/10/04	
Analysis Date		12/15/05		12/15/05	
PCB	RTQL	Result	Q	Result	Q
Aroclor-1016	16.5	<66.0	U	<62.0	U
Aroclor-1221	16.5	<130	U	<120	U
Aroclor-1232	16.5	<66.0	U	<62.0	U
Aroclor-1242	16.5	<66.0	U	<62.0	U
Aroclor-1248	16.5	<66.0	U	<62.0	U
Aroclor-1254	16.5	<66.0	U	<62.0	U
Aroclor-1260	16.5	<66.0	U	<62.0	U
Aroclor-1262	16.5	<66.0	U	<62.0	U
Aroclor-1268	16.5	<66.0	U	<62.0	U

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WSCF ANALYTICAL RESULTS REPORT

Attention:
Project:

Steve Trent
F04-015: F04-015

Group #: WSCF20042380

Sample #	Client ID	CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
Organic													
W040002581	B19939	TRENT	<i>W 5/20/05</i> Total Pet. Hydrocarbons Gas	SOIL	LA-523-443	U	< 260	ug/kg	1.00	2.5e+02	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	12674-11-2 Aroclor-1016	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	11104-28-2 Aroclor-1221	SOIL	LA-523-427	U	< 130	ug/kg	1.00	1.3e+02	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	11141-16-5 Aroclor-1232	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	53469-21-9 Aroclor-1242	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	12672-29-6 Aroclor-1248	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	11097-69-1 Aroclor-1254	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	11098-82-5 Aroclor-1260	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	37324-23-6 Aroclor-1262	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	11100-14-4 Aroclor-1268	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	100-02-7 4-Nitrophenol	SOIL	LA-523-456	U	< 718	ug/kg	1.00	7.1e+02	12/27/04	12/10/04	12/10/04
W040002581	B19939	TRENT	106-46-7 1,4-Dichlorobenzene	SOIL	LA-523-456	U	< 340	ug/kg	1.00	3.4e+02	12/27/04	12/10/04	12/10/04
W040002581	B19939	TRENT	106-95-2 Phenol	SOIL	LA-523-456	U	< 110	ug/kg	1.00	1.1e+02	12/27/04	12/10/04	12/10/04
W040002581	B19939	TRENT	120-82-1 1,2,4-Trichlorobenzene	SOIL	LA-523-456	U	< 320	ug/kg	1.00	3.2e+02	12/27/04	12/10/04	12/10/04
W040002581	B19939	TRENT	121-14-2 2,4-Dinitrotoluene	SOIL	LA-523-456	U	< 73.0	ug/kg	1.00	73	12/27/04	12/10/04	12/10/04
W040002581	B19939	TRENT	129-00-0 Pyrene	SOIL	LA-523-456	U	< 73.0	ug/kg	1.00	73	12/27/04	12/10/04	12/10/04
W040002581	B19939	TRENT	59-50-7 4-Chloro-3-methylphenol	SOIL	LA-523-456	U	< 73.0	ug/kg	1.00	73	12/27/04	12/10/04	12/10/04
W040002581	B19939	TRENT	821-64-7 N-Nitrosodi-n-propylamine	SOIL	LA-523-456	U	< 73.0	ug/kg	1.00	73	12/27/04	12/10/04	12/10/04
W040002581	B19939	TRENT	83-32-9 Acenaphthene	SOIL	LA-523-456	U	< 73.0	ug/kg	1.00	73	12/27/04	12/10/04	12/10/04
W040002581	B19939	TRENT	87-86-5 Pentachlorophenol	SOIL	LA-523-456	U	< 330	ug/kg	1.00	3.3e+02	12/27/04	12/10/04	12/10/04
W040002581	B19939	TRENT	95-57-8 2-Chlorophenol	SOIL	LA-523-456	U	< 160	ug/kg	1.00	1.6e+02	12/27/04	12/10/04	12/10/04
W040002581	B19939	TRENT	126-73-8 Tributyl phosphate	SOIL	LA-523-456	U	< 73.0	ug/kg	1.00	73	12/27/04	12/10/04	12/10/04
W040002581	B19939	TRENT	75-35-4 1,1-Dichloroethene	SOIL	LA-523-455	U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	79-01-6 Trichloroethene	SOIL	LA-523-455	U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	71-43-2 Benzene	SOIL	LA-523-455	U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	108-88-3 Toluene	SOIL	LA-523-455	U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04

MDL = Minimum Detection Limit

RQ = Result Qualifier

B - The analyte < the RDL but > = the IDL/MDL (Inorganic)

U - Analyzed for but not detected above limiting criteria.

DF = Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Report WGPP/ver. 1.1

Groundwater Remediation Program

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WSCF ANALYTICAL RESULTS REPORT

Attention:
Project:

Steve Trent
F04-015: F04-015

Group #: WSCF20042380

Sample #	Client ID	CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W040002581	B19939	TRENT	79-00-5	1,1,2-Trichloroethane	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	79-34-5	1,1,2,2-Tetrachloroethane	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	71-36-3	1-Butanol	SOIL	LA-523-455 U	< 44.0	ug/kg	1.00	44	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	104-51-8	n-Butylbenzene	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	156-80-5	trans-1,2-Dichloroethylene	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	156-59-2	cis-1,2-Dichloroethylene	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	TPHDIESEL	Total Pet. Hydrocarbons Diesel	SOIL	NWTPH U	< 4.10e+03	ug/kg	1.00	4.1e+03	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	TPHKEROSENE	Kerosene	SOIL	NWTPH U	< 4.10e+03	ug/kg	1.00	4.1e+03	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	TPH GASOLINE	Total Pet. Hydrocarbons Gas	SOIL	LA-523-448 U	< 250	ug/kg	1.00	2.5e+02	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	12674-11-2	Aroclor-1016	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	11104-28-2	Aroclor-1221	SOIL	LA-523-427 U	< 120	ug/kg	1.00	1.2e+02	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	11141-18-5	Aroclor-1232	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	53469-21-8	Aroclor-1242	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	12672-29-6	Aroclor-1248	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	11097-89-1	Aroclor-1254	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	11098-82-5	Aroclor-1260	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	37324-23-5	Aroclor-1262	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	11100-14-4	Aroclor-1268	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	100-82-7	1-Nitrophenol	SOIL	LA-523-456 U	< 660	ug/kg	1.00	6.6e+02	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	106-46-7	1,4-Dichlorobenzene	SOIL	LA-523-456 U	< 330	ug/kg	1.00	3.3e+02	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	108-95-2	Phenol	SOIL	LA-523-456 U	< 100	ug/kg	1.00	1.0e+02	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	120-82-1	1,2,4-Trichlorobenzene	SOIL	LA-523-456 U	< 310	ug/kg	1.00	3.1e+02	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	121-14-2	2,4-Dinitrotoluene	SOIL	LA-523-456 U	< 70.0	ug/kg	1.00	70	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	129-00-0	Pyrene	SOIL	LA-523-456 U	< 70.0	ug/kg	1.00	70	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	59-50-7	4-Chloro-3-methylphenol	SOIL	LA-523-456 U	< 70.0	ug/kg	1.00	70	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	821-64-7	N-Nitrosodi-n-dipropylamine	SOIL	LA-523-456 U	< 70.0	ug/kg	1.00	70	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	83-32-9	Acenaphthene	SOIL	LA-523-456 U	< 70.0	ug/kg	1.00	70	12/28/04	12/10/04	12/10/04

MDL = Minimum Detection Limit
RQ = Result Qualifier

B - The analyte < the RDL but > = the IDL/MDL (inorganic)

U - Analyzed for but not detected above limiting criteria.

DF = Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Report WGPP/ver. 1.1

Groundwater Remediation Program

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000013

Sample Delivery Group	WSCF20042380
Sample Matrix	Soil
Sample Visual	N/A
SAF Number	F04-015
Data Deliverable	Summary Report

Introduction

Two (2) 200-MW-1 Characterization Sampling and Analysis – Soil/216-U-3, 17.5' – 20', samples (B19939 and B19940) were received at the WSCF Laboratory on December 10, 2004. The samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Groundwater Remediation Program – Letter of Instruction*, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the Chain of Custody and Request for Sample Analysis forms are included as Attachment 3.

Analytical Methodology for Requested Analyses

Inorganic

- Anions by EPA Method 300. Analytical work was performed with no deviations to the approved method.
- Cyanide by EPA Method 600/R-94-111 300. Analytical work was performed with no deviations to the approved method.
- ICP-MS Metals by EPA Method 200.8. Analytical work was performed with no deviations to the approved method.
- Percent Solids by EPA Method 160.3. Analytical work was performed with no deviations to the approved method.
- pH by EPA Method 9045C. Analytical work was performed with no deviations to the approved method.

Organic

- PCB by EPA Method 8082. Analytical work was performed with no deviations to the approved method.

- Semi-VOA by EPA Method 8270C. Analytical work was performed with no deviations to the approved method.
- TPH Diesel/Gas Range by WDOE Method NWTPH-Dx/Gx. Analytical work was performed with no deviations to the approved method.
- VOA by EPA Method 8260B. Analytical work was performed with no deviations to the approved method.

Radiochemistry

- All RadChem analyses (AEA (Plutonium, Americium and Uranium), GEA, Sr-89/90) were run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved method.

Inorganic Comments

Anions - The hold times for Nitrite and Nitrate analyses were not met. A Blank, Laboratory Control Sample, Duplicate, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See pages 13 through 14 for QC details.

Analytical Notes:

- Preparation Date: 06-jan-2005.
- Duplicate, Matrix Spike and Matrix Spike Duplicate QC samples were analyzed on sample# B19945 (SDG# 20042473, SAF# F04-015).
- Nitrate and Sulfate – Samples B19939 and B19940 results were B-flagged; the analyte was less than the reportable detection limit, but greater than or equal to the method detection limit.

All QC controls are within the established limits.

Cyanide- The hold time for this analysis was met. A Blank, Preparation Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See page 15 for QC details. All QC controls are within the established limits.

ICP-MS Metals – The hold time for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 16 through 21 for QC details. Analytical Notes:

- Preparation Date: 14-dec-2004.
- Spike Precision was evaluated on:
 - Uranium – Sample # B19939

- Silver, Cadmium, Chromium, Copper, Mercury and Lead – Sample# B19974 (SDG# 20042382, SAF# F04-019).
- Copper, Mercury and Lead - The analytes detected in the associated preparation Blank sample were evaluated and there was no significant affect on the sample results.

All other QC controls are within the established limits.

Percent Solids – Analyzed for organic results correction.

pH – The hold times for this analysis was met. All internal laboratory controls were within established limits.

Organic Comments

- Sample results were moisture corrected and reported on a dry-weight basis.
- PCB** – The hold times for this analysis was met. A Blank, Duplicate, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 27 through 28 for QC details. Analytical Notes:
- Preparation Date: 13-dec-2004.
 - Matrix Spike and Matrix Spike Duplicate QC samples were analyzed on sample# B19197 (SDG# 20042304, SAF# F03-025).
 - Tetrachloro-m-xylene (surrogate) – Matrix Spike Duplicate and Laboratory Control Sample recoveries were below established laboratory limits and the matrix Relative Percent Difference exceeded established laboratory limits due to excessive blow down while concentration of the sample. The Decachlorobiphenyl and Aroclor-1254 recoveries were within established limits, so the sample B19939 and B19940 results were not flagged.

All other QC controls are within the established limits.

Semi-VOA – The hold times for this analysis was met. A Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 29 through 32 for QC details. Analytical Note:

- Preparation Date: 13-dec-2004.

All QC controls are within the established limits.

TPHD-WA-Diesel - The hold times for this analysis were met. A Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See page 33 for QC details. Analytical Note:

- Preparation Date: 13-dec-2004.

All QC controls are within the established limits.

TPHD-WA-Gas - The hold times for this analysis were met. A Blank, Laboratory Control Sample, Duplicate Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See page 34 for QC details. Analytical Notes:

- Preparation Date: 15-dec-2004.
- Matrix Spike and Matrix Spike Duplicate QC samples were analyzed on sample# B19197 (SDG# 20042304, SAF# F03-025).
- Duplicate QC samples were analyzed on sample# B1B578 (SDG# 20042392, SAF# F03-006).
- Total Petroleum Hydrocarbons Gas – The Laboratory Control Sample recovery was below established laboratory limits. All other QC samples were within limits and the sample B19939 and B19940 results were not flagged.

All other QC controls are within the established limits.

VOA – The hold times for this analysis was met. A Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 35 through 37 for QC details. All QC controls are within the established limits.

Radiochemistry Comments


RadChem – There are no hold times associated with these WDOE accredited methods. A Blank, Laboratory Control Sample and Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 40 through 44 for QC details. All QC controls are within the established limits.

Radiochemical Tracer Percent Recovery			
Sample Number	Lab Sample ID	Isotope	Tracer Recovery (Percent)
BLANK		Pu-242	77.6
LCS		Pu-242	72.7
B19939	W040002581	Pu-242	66.8
DUPLICATE		Pu-242	75.2
B19940	W040002582	Pu-242	77.6

4 000017

Radiochemical Tracer Percent Recovery			
Sample Number	Lab Sample ID	Isotope	Tracer Recovery (Percent)
BLANK		Am-243	69.2
LCS		Am-243	99.3
B19939	W040002581	Am-243	90.1
DUPLICATE		Am-243	87.9
B19940	W040002582	Am-243	85.9
BLANK		Sr-85	96.0
LCS		Sr-85	94.6
B19939	W040002581	Sr-85	102.0
DUPLICATE		Sr-85	105.3
B19940	W040002582	Sr-85	93.1
BLANK		U-232	79.9
LCS		U-232	72.1
B19939	W040002581	U-232	77.5
DUPLICATE		U-232	85.1
B19940	W040002582	U-232	92.2

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.


Herlene S. Rich
WSCF Production Control

FLUOR Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				FO4-013-045	PAGE 1 OF 1
COLLECTOR Pope/Hester/Hughes/Wiberg/Pope/Hester/Tyler/Wiberg	COMPANY CONTACT CS Carlock	TELEPHONE NO. 372-9638	PROJECT COORDINATOR TRENT, SJ		PRICE CODE BN	DATA TURNAROUND 45 Days / 45 Days	
SAMPLING LOCATION 216-U-3; 1462-1463	PROJECT DESIGNATION 200-MW-1 Characterization Sampling and Analysis - Soil	FIELD LOGBOOK NO. NHF-H-386 1		SAF NO. FO4-015	AIR QUALITY <input type="checkbox"/>		
ICE CHEST NO.	COA 119144ES10	METHOD OF SHIPMENT Government Vehicle		BILL OF LADING/AIR BILL NO. N/A			
SHIPPED TO Waste Sampling & Characterization		OFFSITE PROPERTY NO. N/A					
MATRIX* A=Air D=Drum L=Liquid S=Soil O=Oil SC=Scum T=Trash V=Vegetation W=Water Wt=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/REMARKS N/A	PRESERVATION AG	Cool °C 40°	Cool °C None			
	TYPE OF CONTAINER	AG	40°	40°	500mL		
	NO. OF CONTAINERS(S)	1	1	1	1		
	VOLUME	250mL	120mL	250mL	500mL		
SPECIAL HANDLING AND/OR STORAGE Rubber glove Tie To: B19951	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	SEE ITEM (4) IN SPECIAL INSTRUCTIONS		
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B19939	SOIL W04002581	12/10/94	1050	X	X	X	
B19940	SOIL W04002582	12/10/94	1050	X	X	X	
<p>CHAIN OF POSSESSION</p> <p>SIGN/PRINT NAMES</p> <p>RELINQUISHED BY/REMOVED FROM: <i>Dr. W. W. W. W.</i> DATE/TIME: 12/10/94</p> <p>RELINQUISHED BY/REMOVED FROM: <i>Dr. W. W. W. W.</i> DATE/TIME: 12/10/94</p> <p>RELINQUISHED BY/REMOVED FROM: DATE/TIME:</p> <p>RELINQUISHED BY/REMOVED FROM: DATE/TIME:</p> <p>RELINQUISHED BY/REMOVED FROM: DATE/TIME:</p> <p>RELINQUISHED BY/REMOVED FROM: DATE/TIME:</p> <p>RELINQUISHED BY/REMOVED FROM: DATE/TIME:</p> <p>RELINQUISHED BY/REMOVED FROM: DATE/TIME:</p> <p>RELINQUISHED BY/REMOVED FROM: DATE/TIME:</p>							
<p>SPECIAL INSTRUCTIONS</p> <p>** The laboratory is to report both kerosene and diesel range compounds from the WTPH-D analysis.</p> <p>(1) IC Anions - 300.0 (Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate) Total Cyanide - 90.0; pH (Soil) - 9.045;</p> <p>(2) IC/MS - 200.8 (TAL) (Cadmium, Chromium, Copper, Silver) IC/MS - 200.8 (Add-on) (Lead, Uranium) 200.8 HG - IC/MS (Mercury)</p> <p>(3) VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Butanol, cis-1,2-Dichloroethylene, n-Butylbenzene, trans-1,2-Dichloroethylene)</p> <p>(4) Sem-VOA - 8270A (Add-On) (Tributyl phosphate) TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D (Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range)</p> <p>(5) Gamma Spectroscopy (Caesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155) Isotopic Uranium; Americium-241; Strontium-89,90 - Total Sr; GEA - Expedite 24 hr turn around 12/17/94</p>							
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME			
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DEPOSED BY		DATE/TIME			

000019

Appendix 5

Data Validation Supporting Documentation

000020

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT: 200-mw-1			DATA PACKAGE: 42380		
VALIDATOR: TLI		LAB: WSCF		DATE: 5/12/05	
			SDG: 42380		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	<u>SW-846 8082</u>	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
B19939 B19940					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations acceptable? Yes No N/AContinuing calibrations acceptable? Yes No N/AStandards traceable? Yes No N/AStandards expired? Yes No N/ACalculation check acceptable? Yes No N/ADDT and endrin breakdowns acceptable? Yes No N/A

Comments: _____

PCB DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) Yes No N/A

Calibration blank results acceptable? (Levels D, E) Yes No N/A

Laboratory blanks analyzed? Yes No N/A

Laboratory blank results acceptable? Yes No N/A

Field/trip blanks analyzed? (Levels C, D, E) Yes No N/A

Field/trip blank results acceptable? (Levels C, D, E) Yes No N/A

Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: No FB

4. ACCURACY (Levels C, D, and E)

Surrogates analyzed? Yes No N/A

Surrogate recoveries acceptable? Yes No N/A

Surrogates traceable? (Levels D, E) Yes No N/A

Surrogates expired? (Levels D, E) Yes No N/A

MS/MSD samples analyzed? Yes No N/A

MS/MSD results acceptable? Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A

MS/MSD standards expired? (Levels D, E) Yes No N/A

LCS/BSS samples analyzed? Yes No N/A

LCS/BSS results acceptable? Yes No N/A

Standards traceable? (Levels D, E) Yes No N/A

Standards expired? (Levels D, E) Yes No N/A

Transcription/calculation errors? (Levels D, E) Yes No N/A

Performance audit sample(s) analyzed? Yes No N/A

Performance audit sample results acceptable? Yes No N/A

Comments:

PCB DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ☒ Yes No N/A

Duplicate results acceptable? ☒ Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) Yes No ☒ N/A

MS/MSD standards expired? (Levels D, E) Yes No ☒ N/A

Field duplicate RPD values acceptable? ☒ Yes No N/A

Field split RPD values acceptable? Yes No ☒ N/A

Transcription/calculation errors? (Levels D, E) Yes No ☒ N/A

Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? Yes No ☒ N/A

Positive results resolved acceptably? Yes No ☒ N/A

Comments: _____

7. HOLDING TIMES (all levels)

Samples properly preserved? ☒ Yes No N/A

Sample holding times acceptable? ☒ Yes No N/A

Comments: _____

PCB DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) Yes No N/A
 Compound quantitation acceptable? (Levels D, E) Yes No N/A
 Results reported for all requested analyses? Yes No N/A
 Results supported in the raw data? (Levels D, E) Yes No N/A
 Samples properly prepared? (Levels D, E) Yes No N/A
 Detection limits meet RDL? Yes No N/A *5/12/23*
 Transcription/calculation errors? (Levels D, E) Yes No N/A
 Comments: all over

9. SAMPLE CLEANUP (Levels D and E)

Fluorilil ® (or other absorbent) cleanup performed? Yes No N/A
 Lot check performed? Yes No N/A
 Check recoveries acceptable? Yes No N/A
 GPC cleanup performed? Yes No N/A
 GPC check performed? Yes No N/A
 GPC check recoveries acceptable? Yes No N/A
 GPC calibration performed? Yes No N/A
 GPC calibration check performed? Yes No N/A
 GPC calibration check retention times acceptable? Yes No N/A
 Check/calibration materials traceable? Yes No N/A
 Check/calibration materials Expired? Yes No N/A
 Analytical batch QC given similar cleanup? Yes No N/A
 Transcription/Calculation Errors? Yes No N/A
 Comments:

Appendix 6

Additional Documentation Requested by Client

000025

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380
Matrix: SOLID
Test: PCBs complete list

SAF Number: F04-015
Sample Date: 12/02/04
Receive Date: 12/02/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
Lab ID: W040002532 BATCH QC ASSOCIATED WITH SAMPLE									
MS	Aroclor-1254	11097-69-1	1170.7	115.000	% Recov	12/15/04	75.000	125.000	
MS	Decachlorobiphenyl	2051-24-3	919.97	90.000	% Recov	12/15/04	50.000	150.000	
MS	Tetrachloro-m-xylene	877-09-8	905.45	88.600	% Recov	12/15/04	50.000	150.000	
MSD	Aroclor-1254	11097-69-1	1213.5	118.000	% Recov	12/15/04	75.000	125.000	
MSD	Decachlorobiphenyl	2051-24-3	1001.2	97.000	% Recov	12/15/04	50.000	150.000	
MSD	Tetrachloro-m-xylene	877-09-8	234.89	22.800	% Recov	12/15/04	50.000	150.000	
SPK-RPD	Aroclor-1254	11097-69-1	118.000	2.575	RPD	12/15/04	0.000	25.000	
SPK-RPD	Decachlorobiphenyl	2051-24-3	97.000	7.487	RPD	12/15/04	0.000	20.000	
SPK-RPD	Tetrachloro-m-xylene	877-09-8	22.800	118.133	RPD	12/15/04	0.000	20.000	
Lab ID: W040002581 BATCH QC ASSOCIATED WITH SAMPLE									
SURR	Decachlorobiphenyl	2051-24-3	1284.9	98.800	% Recov	12/15/04	50.000	150.000	
SURR	Tetrachloro-m-xylene	877-09-8	1211.1	91.200	% Recov	12/15/04	50.000	150.000	
Lab ID: W040002582 BATCH QC ASSOCIATED WITH SAMPLE									
SURR	Decachlorobiphenyl	2051-24-3	1194.8	96.700	% Recov	12/15/04	50.000	150.000	
SURR	Tetrachloro-m-xylene	877-09-8	1135.8	92.000	% Recov	12/15/04	50.000	150.000	
BATCH QC									
BLANK	Aroclor-1016	12674-11-2	< 50	n/a	UGKG	12/15/04			U
BLANK	Aroclor-1221	11104-28-2	< 100	n/a	ug/Kg	12/15/04			U
BLANK	Aroclor-1232	11141-18-5	< 50	n/a	ug/Kg	12/15/04			U
BLANK	Aroclor-1242	53469-21-9	< 50	n/a	ug/Kg	12/15/04			U
BLANK	Aroclor-1248	12672-29-6	< 50	n/a	ug/Kg	12/15/04			U

000026

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380

Matrix: SOLID

Test: PCBs complete list

SAF Number: F04-015

Sample Date:

Receive Date:

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
BLANK	Aroclor-1254	11097-69-1	< 50	n/a	ug/Kg	12/15/04			U
BLANK	Aroclor-1260	11096-82-5	< 50	n/a	ug/Kg	12/15/04			U
BLANK	Aroclor-1262	37324-23-5	< 50	n/a	ug/Kg	12/15/04			U
BLANK	Aroclor-1268	11100-14-4	< 50	n/a	ug/Kg	12/15/04			U
BLANK	Decachlorobiphenyl	2051-24-3	903.87	90.400	% Recov	12/15/04	50.000	150.000	
BLANK	Tetrachloro-m-xylene	877-09-8	911.11	91.100	% Recov	12/15/04	50.000	150.000	
LCS	Aroclor-1254	11097-69-1	987.29	98.700	% Recov	12/15/04	70.000	130.000	
LCS	Decachlorobiphenyl	2051-24-3	949.54	95.000	% Recov	12/15/04	50.000	150.000	
LCS	Tetrachloro-m-xylene	877-09-8	0.00	0.000	% Recov	12/15/04	50.000	150.000	

000027

Date: 25 May 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-MW-1 Characterization Sampling and Analysis - Soil
Subject: Volatile - Data Package No.WSCF20042380 (42380)



INTRODUCTION

This memo presents the results of data validation on Data Package No. 42380 prepared by WSCF Analytical Laboratories. (WSCF). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B19939	12/10/04	Soil	C	See note 1
B19940	12/10/04	Soil	C	See note 1

1 - Volatiles by 8260A.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-MW-1 Miscellaneous Waste Group OU RI/FS Workplan, DOE/RL-2001-65 (Rev. 0), April 2002. Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

• Holding Times/Sample Preservation

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 14 days of the date of sample collection.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the

000001

limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holing times were acceptable.

- **Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples of a given matrix. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the project quantitation limit (MDL) and is less than five times (or less than ten times for laboratory contaminants) the highest associated blank result, the sample result value is raised to the MDL, qualified as undetected and flagged "U".

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike

Matrix spike/matrix spike duplicate and blank spike analyses are used to assess the analytical accuracy of the reported data. The matrix spike/matrix spike duplicate are used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using the target compounds for which percent recoveries must be within 50-150%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All accuracy and blank spike results were acceptable.

000002

Surrogate Recovery

The analysis of surrogate compounds provides a measure of system performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory program. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Samples with surrogate recoveries less than ten percent are qualified as estimates and flagged "J" for detects, and rejected and flagged "UR" for nondetects. Undetected compounds with surrogate recoveries greater than the upper control limit require no qualification. Surrogates are not required for formaldehyde analysis.

All surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Sample results must be within RPD limits of +/- 35%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All MS/MSD RPD results were acceptable.

Field Duplicate Samples

One set of field duplicates (B19939/B19940) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Detection Limits**

Reported analytical detection levels are compared against the required target quantitation limits (RTQLs) to ensure that laboratory detection levels meet the required criteria. Four analytes exceeded the RTQL. Under the FHI statement of work, no qualification is required.

000003

- **Completeness**

Data package No. 42380 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Four analytes exceeded the RTQL. Under the FHI statement of work, no qualification is required.

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2001-65, Rev. 0, *200-MW-1 Miscellaneous Waste Group OUs RI/FS Work Plan*, April 2002.

Appendix 1

Glossary of Data Reporting Qualifiers

000005

Qualifiers which may be applied by data validator in compliance with the BHI validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

000006

Appendix 2
Summary of Data Qualification

000007

VOLATILE DATA QUALIFICATION SUMMARY*

SDG: 42380	REVIEWER: TLI	DATE: 5/25/05	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: FLUOR-HANFORD					
Laboratory: WSCF					
Case:		SDG: WSCF20042380			
Sample Number		B19939		B19940	
Remarks				Duplicate	
Sample Date		12/10/04		12/10/04	
VOA	RTQL	Result	Q	Result	Q
1,1-Dichloroethane		<2.20	U	<2.10	U
Trichloroethene		<2.20	U	<2.10	U
Benzene	5	<2.20	U	<2.10	U
Toluene		<2.20	U	<2.10	U
Chlorobenzene	5	<2.20	U	<2.10	U
1,1-Dichloroethane	10	<2.20	U	<2.10	U
Ethylbenzene	5	<2.20	U	<2.10	U
Styrene		<2.20	U	<2.10	U
cis-1,3-Dichloropropene		<2.20	U	<2.10	U
trans-1,3-Dichloropropene		<2.20	U	<2.10	U
1,2-Dichloroethane	5	<2.20	U	<2.10	U
4-Methyl-2-pentanone		<2.20	U	<2.10	U
Dibromochloromethane		<2.20	U	<2.10	U
Tetrachloroethene		<2.20	U	<2.10	U
Xylenes (total)		<2.20	U	<2.10	U
1,2-Dichloroethene (total)		<2.20	U	<2.10	U
Carbon Tetrachloride	5	<2.20	U	<2.10	U
2-Hexanone		<2.20	U	<2.10	U
Acetone	20	<2.20	U	<2.10	U
Chloroform	5	<2.20	U	<2.10	U
1,1,1-Trichloroethane	5	<2.20	U	<2.10	U
Bromomethane		<2.20	U	<2.10	U
Chloromethane		<2.20	U	<2.10	U
Chloroethane		<2.20	U	<2.10	U
Vinyl Chloride		<2.20	U	<2.10	U
Methylene Chloride	5	<2.20	U	<2.10	U
Carbon Disulfide		<2.20	U	<2.10	U
Bromoform		<2.20	U	<2.10	U
Dibromochloromethane		<2.20	U	<2.10	U
1,2-Dichloropropane		<2.20	U	<2.10	U
2-Butanone		<2.20	U	<2.10	U
1,1,2-Trichloroethane	5	<2.20	U	<2.10	U
1,1,2,2-Tetrachloroethane		<2.20	U	<2.10	U
1-Butanol		<44.0	U	<42.0	U
n-Butylbenzene	5	<2.20	U	<2.10	U
trans-1,2-Dichloroethylene	1	<2.20	U	<2.10	U
cis-1,2-Dichloroethylene	1	<2.20	U	<2.10	U

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize mis-interpretation of results. All other qualifiers shown were applied during validation.

000010

WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F04-015: F04-015

Group #: WSCF20042380

Sample #	Client ID	CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
Organic													
W040002581	B19939	TRENT	TPH GASOLINE	Total Pet. Hydrocarbons Gas	SOIL	LA-523-443	U	< 250	ug/kg	1.00	2.5e+02	12/15/04	12/10/04
W040002581	B19939	TRENT	12674-11-2	Aroclor-1018	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04
W040002581	B19939	TRENT	11104-28-2	Aroclor-1221	SOIL	LA-523-427	U	< 130	ug/kg	1.00	1.3e+02	12/15/04	12/10/04
W040002581	B19939	TRENT	11141-16-5	Aroclor-1232	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04
W040002581	B19939	TRENT	53469-21-9	Aroclor-1242	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04
W040002581	B19939	TRENT	12672-29-6	Aroclor-1248	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04
W040002581	B19939	TRENT	11097-69-1	Aroclor-1254	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04
W040002581	B19939	TRENT	11096-82-5	Aroclor-1260	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04
W040002581	B19939	TRENT	37324-23-5	Aroclor-1262	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04
W040002581	B19939	TRENT	11100-14-4	Aroclor-1268	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04
W040002581	B19939	TRENT	100-02-7	4-Nitrophenol	SOIL	LA-523-456	U	< 710	ug/kg	1.00	7.1e+02	12/27/04	12/10/04
W040002581	B19939	TRENT	106-46-7	1,4-Dichlorobenzene	SOIL	LA-523-456	U	< 240	ug/kg	1.00	3.4e+02	12/27/04	12/10/04
W040002581	B19939	TRENT	108-95-2	Phenol	SOIL	LA-523-456	U	< 110	ug/kg	1.00	1.1e+02	12/27/04	12/10/04
W040002581	B19939	TRENT	120-82-1	1,2,4-Trichlorobenzene	SOIL	LA-523-456	U	< 320	ug/kg	1.00	3.2e+02	12/27/04	12/10/04
W040002581	B19939	TRENT	121-14-2	2,4-Dinitrotoluene	SOIL	LA-523-456	U	< 79.0	ug/kg	1.00	73	12/27/04	12/10/04
W040002581	B19939	TRENT	129-00-0	Pyrene	SOIL	LA-523-456	U	< 73.0	ug/kg	1.00	73	12/27/04	12/10/04
W040002581	B19939	TRENT	59-50-7	4-Chloro-3-methylphenol	SOIL	LA-523-456	U	< 73.0	ug/kg	1.00	73	12/27/04	12/10/04
W040002581	B19939	TRENT	621-64-7	N-Nitrosodi-n-dipropylamine	SOIL	LA-523-456	U	< 73.0	ug/kg	1.00	73	12/27/04	12/10/04
W040002581	B19939	TRENT	83-32-9	Acenaphthene	SOIL	LA-523-456	U	< 73.0	ug/kg	1.00	73	12/27/04	12/10/04
W040002581	B19939	TRENT	87-86-5	Pentachlorophenol	SOIL	LA-523-456	U	< 330	ug/kg	1.00	3.3e+02	12/27/04	12/10/04
W040002581	B19939	TRENT	95-57-8	2-Chlorophenol	SOIL	LA-523-456	U	< 160	ug/kg	1.00	1.6e+02	12/27/04	12/10/04
W040002581	B19939	TRENT	126-78-0	Tributyl phosphate	SOIL	LA-523-456	U	< 79.0	ug/kg	1.00	73	12/27/04	12/10/04
W040002581	B19939	TRENT	75-35-4	1,1-Dichloroethane	SOIL	LA-523-455	U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04
W040002581	B19939	TRENT	79-01-6	Trichloroethane	SOIL	LA-523-455	U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04
W040002581	B19939	TRENT	71-43-2	Benzene	SOIL	LA-523-455	U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04
W040002581	B19939	TRENT	106-88-3	Toluene	SOIL	LA-523-455	U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04

MDL = Minimum Detection Limit
RQ = Result Qualifier

B - The analyte < the RDL but > = the IDL/MDL (Inorganic).

U - Analyzed for but not detected above limiting criteria.

DF = Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Report WGPP/ver. 1.1

Groundwater Remediation Program

WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F04-015: F04-015

Group #: WSCF20042380

Sample #	Client ID	CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W040002581	B19939	TRENT	108-90-7	Chlorobenzene	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	75-34-3	1,1-Dichloroethane	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	100-41-4	Ethylbenzene	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	100-42-5	Styrene	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	10061-01-5	cis-1,3-Dichloropropene	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	10061-02-6	trans-1,3-Dichloropropene	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	107-06-2	1,2-Dichloroethane	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	108-10-1	4-Methyl-2-Pentanone	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	124-48-1	Dibromochloromethane	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	127-18-4	Tetrachloroethene	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	1330-20-7	Xylenes (total)	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	540-59-0	1,2-Dichloroethene(Total)	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	56-23-5	Carbon tetrachloride	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	591-78-6	2-Hexanone	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	67-64-1	Acetone	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	67-66-3	Chloroform	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	71-55-6	1,1,1-Trichloroethane	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	74-83-9	Bromomethane	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	74-87-3	Chloromethane	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	75-00-3	Chloroethane	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	75-01-4	Vinyl chloride	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	75-09-2	Methylenechloride	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	75-15-0	Carbon disulfide	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	75-25-2	Bromoform	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	75-27-4	Bromodichloromethane	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	78-87-5	1,2-Dichloropropane	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	78-93-3	2-Butanone	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04

MDL = Minimum Detection Limit
RQ = Result Qualifier

B - The analyte < the RDL but > = the MDL/MDL (inorganic)

U - Analyzed for but not detected above limiting criteria.

DF = Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Report WGPP/ver. 1.1

Groundwater Remediation Program

Handwritten: 5/20/05

WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F04-015: F04-015

Group #: WSCF20042380

Sample #	Client ID	CAS #	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W040002581	B19939	TRENT	79-00-5	1,1,2-Trichloroethane	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	79-34-5	1,1,2,2-Tetrachloroethane	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	71-38-3	1-Butanol	SOIL	LA-523-455 U	< 44.0	ug/kg	1.00	44	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	104-51-8	n-Butylbenzene	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	156-60-5	trans-1,2-Dichloroethylene	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	156-59-2	cis-1,2-Dichloroethylene	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	TPH DIESEL	Total Pet. Hydrocarbons Diesel	SOIL	NWTPH U	< 4.1e+03	ug/kg	1.00	4.1e+03	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	TPH KEROSENE	Kerosene	SOIL	NWTPH U	< 4.1e+03	ug/kg	1.00	4.1e+03	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	TPH GASOLINE	Total Pet. Hydrocarbons Gas	SOIL	LA-523-443 U	< 250	ug/kg	1.00	2.5e+02	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	12874-11-2	Aroclor-1016	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	11104-28-2	Aroclor-1221	SOIL	LA-523-427 U	< 120	ug/kg	1.00	1.2e+02	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	11141-18-5	Aroclor-1232	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	53469-21-9	Aroclor-1242	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	12672-29-6	Aroclor-1248	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	11097-69-1	Aroclor-1254	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	11098-82-5	Aroclor-1260	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	37324-23-5	Aroclor-1262	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	11100-14-4	Aroclor-1268	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	100-02-7	4-Nitrophenol	SOIL	LA-523-456 U	< 680	ug/kg	1.00	6.8e+02	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	106-46-7	1,4-Dichlorobenzene	SOIL	LA-523-456 U	< 330	ug/kg	1.00	3.3e+02	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	108-95-2	Phenol	SOIL	LA-523-456 U	< 100	ug/kg	1.00	1.0e+02	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	120-82-1	1,2,4-Trichlorobenzene	SOIL	LA-523-456 U	< 310	ug/kg	1.00	3.1e+02	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	121-14-2	2,4-Dinitrotoluene	SOIL	LA-523-456 U	< 70.0	ug/kg	1.00	70	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	129-00-0	Pyrene	SOIL	LA-523-456 U	< 70.0	ug/kg	1.00	70	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	59-50-7	4-Chloro-3-methylphenol	SOIL	LA-523-456 U	< 70.0	ug/kg	1.00	70	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	621-64-7	N-Nitrosodi-n-dipropylamine	SOIL	LA-523-456 U	< 70.0	ug/kg	1.00	70	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	83-32-9	Acenaphthene	SOIL	LA-523-456 U	< 70.0	ug/kg	1.00	70	12/28/04	12/10/04	12/10/04

MDL = Minimum Detection Limit

RQ = Result Qualifier

B - The analyte < the RDL but > = the IDL/MDL (inorganic)

U - Analyzed for but not detected above limiting criteria.

DF = Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Report WGPP/ver. 1.1

Groundwater Remediation Program

Handwritten signature and date: 5/20/05

WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F04-015: F04-015

Group #: WSCF20042380

Sample #	Client ID	CAS #	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive	
WD40002582	B19940	TRENT	87-86-5	Pentachlorophenol	SOIL	LA-523-456	U	< 310	ug/kg	1.00	3.1e+02	12/28/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	95-57-8	2-Chlorophenol	SOIL	LA-523-456	U	< 150	ug/kg	1.00	1.5e+02	12/28/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	126-73-8	Tricloryl phosphate	SOIL	LA-523-456	U	< 70.0	ug/kg	1.00	70	12/28/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	75-35-4	1,1-Dichloroethene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	79-01-6	Trichloroethene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	71-43-2	Benzene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	108-88-3	Toluene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	108-90-7	Chlorobenzene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	75-34-3	1,1-Dichloroethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	100-41-4	Ethylbenzene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	100-42-5	Styrene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	10061-01-6	cis-1,3-Dichloropropene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	10061-02-6	trans-1,3-Dichloropropene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	107-06-2	1,2-Dichloroethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	108-10-1	4-Methyl-2-Pentanone	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	124-48-1	Dibromochloromethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	127-18-4	Tetrachloroethene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	1330-20-7	Xylenes (total)	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	540-59-0	1,2-Dichloroethane(Total)	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	56-23-5	Carbon tetrachloride	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	591-78-6	2-Hexanone	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	67-64-1	Acetone	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	67-66-3	Chloroform	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	71-55-6	1,1,1-Trichloroethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	74-83-9	Bromomethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	74-87-3	Chloromethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
WD40002582	B19940	TRENT	75-00-3	Chloroethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04

MDL = Minimum Detection Limit

B - The analyte < the RDL but > = the IOL/MDL (inorganic)

U - Analyzed for but not detected above limiting criteria.

RQ = Result Qualifier

DF = Dilution Factor

* - Indicates results that have NOT been validated;

+ - Indicates more than six qualifier symbols

Report WGPP/ver. 1.1

Groundwater Remediation Program

Handwritten signature and date: 5/20/05

WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F04-015: F04-015

Group #: WSCF20042380

														WSCF	
Sample #	Client ID		CAS #	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive	
W040002582	B19940	TRENT	75-01-4	Vinyl chloride	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04	
W040002582	B19940	TRENT	75-09-2	Methylenechloride	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04	
W040002582	B19940	TRENT	75-15-0	Carbon disulfide	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04	
W040002582	B19940	TRENT	75-25-2	Bromoform	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04	
W040002582	B19940	TRENT	75-27-4	Bromodichloromethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04	
W040002582	B19940	TRENT	78-87-5	1,2-Dichloropropane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04	
W040002582	B19940	TRENT	78-93-3	2-Butanone	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04	
W040002582	B19940	TRENT	79-00-5	1,1,2-Trichloroethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04	
W040002582	B19940	TRENT	79-34-5	1,1,2,2-Tetrachloroethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04	
W040002582	B19940	TRENT	71-38-3	1-Butanol	SOIL	LA-523-455	U	< 42.0	ug/kg	1.00	42	12/15/04	12/10/04	12/10/04	
W040002582	B19940	TRENT	104-51-8	n-Butylbenzene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04	
W040002582	B19940	TRENT	156-60-5	trans-1,2-Dichloroethylene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04	
W040002582	B19940	TRENT	156-59-2	cis-1,2-Dichloroethylene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04	
W040002582	B19940	TRENT	TPH DIESEL	Total Pet. Hydrocarbons Diesel	SOIL	NWTFH	U	< 3.90e+03	ug/kg	1.00	3.90e+03	12/15/04	12/10/04	12/10/04	
W040002582	B19940	TRENT	TPH KEROSENE	Kerosene	SOIL	NWTFH	U	< 3.90e+03	ug/kg	1.00	3.90e+03	12/15/04	12/10/04	12/10/04	

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MDL=Minimum Detection Limit
RQ=Result Qualifier

B - The analyte < the RDL but > = the IDL/MDL (Inorganic)

U - Analyzed for but not detected above limiting criteria.

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

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Groundwater Remediation Program

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Sample Delivery Group	WSCF20042380
Sample Matrix	Soil
Sample Visual	N/A
SAF Number	F04-015
Data Deliverable	Summary Report

Introduction

Two (2) 200-MW-1 Characterization Sampling and Analysis – Soil/216-U-3, 17.5' – 20', samples (B19939 and B19940) were received at the WSCF Laboratory on December 10, 2004. The samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Groundwater Remediation Program – Letter of Instruction*, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the Chain of Custody and Request for Sample Analysis forms are included as Attachment 3.

Analytical Methodology for Requested Analyses

Inorganic

- Anions by EPA Method 300. Analytical work was performed with no deviations to the approved method.
- Cyanide by EPA Method 600/R-94-111 300. Analytical work was performed with no deviations to the approved method.
- ICP-MS Metals by EPA Method 200.8. Analytical work was performed with no deviations to the approved method.
- Percent Solids by EPA Method 160.3. Analytical work was performed with no deviations to the approved method.
- pH by EPA Method 9045C. Analytical work was performed with no deviations to the approved method.

Organic

- PCB by EPA Method 8082. Analytical work was performed with no deviations to the approved method.

- Semi-VOA by EPA Method 8270C. Analytical work was performed with no deviations to the approved method.
- TPH Diesel/Gas Range by WDOE Method NWTPH-Dx/Gx. Analytical work was performed with no deviations to the approved method.
- VOA by EPA Method 8260B. Analytical work was performed with no deviations to the approved method.

Radiochemistry

- All RadChem analyses (AEA (Plutonium, Americium and Uranium), GEA, Sr-89/90) were run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved method.

Inorganic Comments

Anions - The hold times for Nitrite and Nitrate analyses were not met. A Blank, Laboratory Control Sample, Duplicate, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See pages 13 through 14 for QC details. Analytical Notes:

- Preparation Date: 06-jan-2005.
- Duplicate, Matrix Spike and Matrix Spike Duplicate QC samples were analyzed on sample# B19945 (SDG# 20042473, SAF# F04-015).
- Nitrate and Sulfate – Samples B19939 and B19940 results were B-flagged; the analyte was less than the reportable detection limit, but greater than or equal to the method detection limit.

All QC controls are within the established limits.

Cyanide- The hold time for this analysis was met. A Blank, Preparation Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See page 15 for QC details. All QC controls are within the established limits.

ICP-MS Metals – The hold time for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 16 through 21 for QC details. Analytical Notes:

- Preparation Date: 14-dec-2004.
- Spike Precision was evaluated on:
 - Uranium – Sample # B19939

- Silver, Cadmium, Chromium, Copper, Mercury and Lead – Sample# B19974 (SDG# 20042382, SAF# F04-019).

- Copper, Mercury and Lead - The analytes detected in the associated preparation Blank sample were evaluated and there was no significant affect on the sample results.

All other QC controls are within the established limits.

Percent Solids – Analyzed for organic results correction.

pH – The hold times for this analysis was met. All internal laboratory controls were within established limits.

Organic Comments

- Sample results were moisture corrected and reported on a dry-weight basis.

PCB – The hold times for this analysis was met. A Blank, Duplicate, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 27 through 28 for QC details. Analytical Notes:

- Preparation Date: 13-dec-2004.
- Matrix Spike and Matrix Spike Duplicate QC samples were analyzed on sample# B19197 (SDG# 20042304, SAF# F03-025).
- Tetrachloro-m-xylene (surrogate) – Matrix Spike Duplicate and Laboratory Control Sample recoveries were below established laboratory limits and the matrix Relative Percent Difference exceeded established laboratory limits due to excessive blow down while concentration of the sample. The Decachlorobiphenyl and Aroclor-1254 recoveries were within established limits, so the sample B19939 and B19940 results were not flagged.

All other QC controls are within the established limits.

Semi-VOA – The hold times for this analysis was met. A Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 29 through 32 for QC details. Analytical Note:

- Preparation Date: 13-dec-2004.

All QC controls are within the established limits.

TPHD-WA-Diesel - The hold times for this analysis were met. A Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See page 33 for QC details. Analytical Note:

- Preparation Date: 13-dec-2004.

All QC controls are within the established limits.

TPHD-WA-Gas - The hold times for this analysis were met. A Blank, Laboratory Control Sample, Duplicate Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See page 34 for QC details. Analytical Notes:

- Preparation Date: 15-dec-2004.
- Matrix Spike and Matrix Spike Duplicate QC samples were analyzed on sample# B19197 (SDG# 20042304, SAF# F03-025).
- Duplicate QC samples were analyzed on sample# B1B578 (SDG# 20042392, SAF# F03-006).
- Total Petroleum Hydrocarbons Gas – The Laboratory Control Sample recovery was below established laboratory limits. All other QC samples were within limits and the sample B19939 and B19940 results were not flagged.

All other QC controls are within the established limits.

VOA – The hold times for this analysis was met. A Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 35 through 37 for QC details. All QC controls are within the established limits.

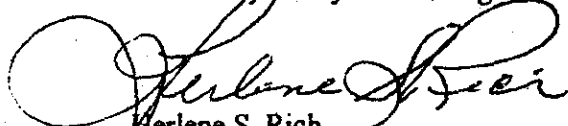
Radiochemistry Comments

RadChem – There are no hold times associated with these WDOE accredited methods. A Blank, Laboratory Control Sample and Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 40 through 44 for QC details. All QC controls are within the established limits.

Radiochemical Tracer Percent Recovery			
Sample Number	Lab Sample ID	Isotope	Tracer Recovery (Percent)
BLANK		Pu-242	77.6
LCS		Pu-242	72.7
B19939	W040002581	Pu-242	66.8
DUPLICATE		Pu-242	75.2
B19940	W040002582	Pu-242	77.6

Radiochemical Tracer Percent Recovery			
Sample Number	Lab Sample ID	Isotope	Tracer Recovery (Percent)
BLANK		Am-243	69.2
LCS		Am-243	99.3
B19939	W040002581	Am-243	90.1
DUPLICATE		Am-243	87.9
B19940	W040002582	Am-243	85.9
BLANK		Sr-85	96.0
LCS		Sr-85	94.6
B19939	W040002581	Sr-85	102.0
DUPLICATE		Sr-85	105.3
B19940	W040002582	Sr-85	93.1
BLANK		U-232	79.9
LCS		U-232	72.1
B19939	W040002581	U-232	77.5
DUPLICATE		U-232	85.1
B19940	W040002582	U-232	92.2

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.


Arlene S. Rich
WSCF Production Control

5 000021

FLUOR Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				FO4-015-045		PAGE 1 OF 1	
COLLECTOR Pope/Hughes/Hoberg/Phelan/Tyler/Wiberg		COMPANY CONTACT CS Carlock		TELEPHONE NO. 372-9638		PROJECT COORDINATOR TRENT, SJ		PLUCE CODE BN	
SAAMPLING LOCATION 216-U-3; 12/10/04 17.5-20.54 12/17/04		PROJECT DESIGNATION 200-MW-1 Characterization Sampling and Analysis - Sol		SAF NO. FO4-015		AIR QUALITY <input type="checkbox"/>		DATA TURNAROUND 45 Days / 45 Days	
ICE CHEST NO.		FIELD LOGBOOK NO. HNP-N-386.1		COA 119144ES10		METHOD OF SHIPMENT Government Vehicle			
SHIPPED TO Waste Sampling & Characterization		OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A					
POSSIBLE SAMPLE HAZARDS/REMARKS N/A		PRESERVATION		Cool 4C		Cool 4C		None	
MATRIX* A=Air DL=Drum L=Liquid DS=Drum S=Solid L=Liquid O=Oil S=Soil SL=Sludge T=Thane V=Vegetation W=Water X=Other		TYPE OF CONTAINER		AG		AG		Square Bottle - Poly	
		NO. OF CONTAINER(S)		1		1		1	
		VOLUME		250mL		40mL		500mL	
SPECIAL HANDLING AND/OR STORAGE Radioactive To To: B19951		SAMPLE ANALYSIS		SEE ITEM (1) IN SPECIAL INSTRUCTIONS		SEE ITEM (2) IN SPECIAL INSTRUCTIONS		SEE ITEM (3) IN SPECIAL INSTRUCTIONS	
20042380		SAMPLE DATE		12/10/04		1050			
B19939		MATRIX*		SOIL		12/10/04		1050	
B19940		MATRIX*		SOIL		12/10/04		1050	
		SIGN/PRINT NAMES							
CHAIN OF POSSESSION		RECEIVED BY/STORER IN		DATE/TIME		DATE/TIME		DATE/TIME	
RELINQUISHED BY/REMOVED FROM		DATE/TIME		12/10/04		12/10/04		12/10/04	
RELINQUISHED BY/REMOVED FROM		DATE/TIME							
RELINQUISHED BY/REMOVED FROM		DATE/TIME							
RELINQUISHED BY/REMOVED FROM		DATE/TIME							
RELINQUISHED BY/REMOVED FROM		DATE/TIME							
RELINQUISHED BY/REMOVED FROM		DATE/TIME							
RELINQUISHED BY/REMOVED FROM		DATE/TIME							
RELINQUISHED BY/REMOVED FROM		DATE/TIME							
LABORATORY SECTION		RECEIVED BY		DATE/TIME		DATE/TIME		DATE/TIME	
FINAL SAMPLE DISPOSITION		DISPOSAL METHOD		DATE/TIME		DATE/TIME		DATE/TIME	

SPECIAL INSTRUCTIONS

** The laboratory is to report both kerosene and diesel range compounds from the WTPH-D analysis.

(1) IC Anions - 300.0 (Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate) Total Cyanide - 9010; pH (Soil) - 9045;

(2) ICP/MS - 200.8 (TAL) (Cadmium, Chromium, Copper, Silver) ICP/MS - 200.8 (Add-on) (Lead, Uranium) 200.8 HG - ICP/MS (Methyl)

(3) VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Butanol, cis-1,2-Dichloroethylene, n-Butylbenzene, trans-1,2-Dichloroethylene)

(4) Semi-VOA -- 8270A (Add-On) (Tributyl phosphate) TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D (Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range)

(5) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155) Isotopic Uranium; Isotopic Uranium; Americium-241; Strontium-89,90 -- Total Sr; GEA - Expedite 24 hr Turn Around 12/17/04

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Appendix 5

Data Validation Supporting Documentation

000023

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT: 200-mw-1			DATA PACKAGE: 42380		
VALIDATOR: TLI		LAB: WSCF		DATE: 3/12/05	
			SDG: 42380		
ANALYSES PERFORMED					
<u>SW-846 8260</u>		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
B19939 B19940					
soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? Yes No N/AInitial calibrations acceptable? Yes No N/AContinuing calibrations acceptable? Yes No N/AStandards traceable? Yes No N/AStandards expired? Yes No N/ACalculation check acceptable? Yes No N/A

Comments: _____

000024

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) Yes No N/A
Calibration blank results acceptable? (Levels D, E) Yes No N/A
Laboratory blanks analyzed? Yes No N/A
Laboratory blank results acceptable? Yes No N/A
Field/trip blanks analyzed? (Levels C, D, E) Yes No N/A
Field/trip blank results acceptable? (Levels C, D, E) Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A
Comments: NO FB

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? Yes No N/A
Surrogate/system monitoring compound recoveries acceptable? Yes No N/A
Surrogates traceable? (Levels D, E) Yes No N/A
Surrogates expired? (Levels D, E) Yes No N/A
MS/MSD samples analyzed? Yes No N/A
MS/MSD results acceptable? Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
MS/MSD standards? (Levels D, E) Yes No N/A
LCS/BSS samples analyzed? Yes No N/A
LCS/BSS results acceptable? Yes No N/A
Standards traceable? (Levels D, E) Yes No N/A
Standards expired? (Levels D, E) Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A
Performance audit sample(s) analyzed? Yes No N/A
Performance audit sample results acceptable? Yes No N/A
Comments: NO PAS

000025

GC/MS ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

MS/MSD samples analyzed? ☒ Yes No N/A
MS/MSD RPD values acceptable? ☒ Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) Yes No ☒ N/A
MS/MSD standards expired? (Levels D, E) Yes No ☒ N/A
Field duplicate RPD values acceptable? ☒ Yes No N/A
Field split RPD values acceptable? Yes No ☒ N/A
Transcription/calculation errors? (Levels D, E) Yes No ☒ N/A

Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? Yes No ☒ N/A
Internal standard areas acceptable? Yes No ☒ N/A
Internal standard retention times acceptable? Yes No ☒ N/A
Standards traceable? Yes No ☒ N/A
Standards expired? Yes No ☒ N/A
Transcription/calculation errors? Yes No ☒ N/A

Comments: _____

7. HOLDING TIMES (all levels)

Samples properly preserved? ☒ Yes No N/A
Sample holding times acceptable? ☒ Yes No N/A

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E)	Yes	No	N/A
Compound quantitation acceptable? (Levels D, E)	Yes	No	N/A
Results reported for all requested analyses?	Yes	No	N/A
Results supported in the raw data? (Levels D, E)	Yes	No	N/A
Samples properly prepared? (Levels D, E)	Yes	No	N/A
Laboratory properly identified and coded all TIC? (Levels D, E)	Yes	No	N/A
Detection limits meet RDL?	Yes	No	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	N/A

Comments: Four

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed?	Yes	No	N/A
GPC check performed?	Yes	No	N/A
GPC check recoveries acceptable?	Yes	No	N/A
GPC calibration performed?	Yes	No	N/A
GPC calibration check performed?	Yes	No	N/A
GPC calibration check retention times acceptable?	Yes	No	N/A
Check/calibration materials traceable?	Yes	No	N/A
Check/calibration materials Expired?	Yes	No	N/A
Analytical batch QC given similar cleanup?	Yes	No	N/A
Transcription/Calculation Errors?	Yes	No	N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

000028

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380
 Matrix: SOLID
 Test: VOA Ground Water Protection

SAF Number: F04-015
 Sample Date: 12/10/04
 Receive Date: 12/10/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
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Lab ID: W040002581
 BATCH QC ASSOCIATED WITH SAMPLE

MS	1,1-Dichloroethene	75-35-4	20.230	80.900	% Recov	12/15/04	63.000	117.000	
MS	Benzene	71-43-2	25.020	100.000	% Recov	12/15/04	75.000	129.000	
MS	4-Bromofluorobenzene	480-00-4	50.990	102.000	% Recov	12/15/04	84.000	118.000	
MS	Chlorobenzene	108-90-7	25.800	103.000	% Recov	12/15/04	79.000	119.000	
MS	1,2-Dichloroethane-d4	17060-07-0	59.240	118.000	% Recov	12/15/04	82.000	138.000	
MS	Toluene-d8	2037-26-5	53.880	108.000	% Recov	12/15/04	89.000	119.000	
MS	Toluene	108-88-3	24.700	98.800	% Recov	12/15/04	76.000	120.000	
MS	Trichloroethene	79-01-8	22.610	90.400	% Recov	12/15/04	73.000	123.000	
MSD	1,1-Dichloroethene	75-35-4	22.230	88.900	% Recov	12/15/04	63.000	117.000	
MSD	Benzene	71-43-2	26.100	104.000	% Recov	12/15/04	75.000	129.000	
MSD	4-Bromofluorobenzene	480-00-4	50.680	101.000	% Recov	12/15/04	84.000	118.000	
MSD	Chlorobenzene	108-90-7	27.770	111.000	% Recov	12/15/04	79.000	119.000	
MSD	1,2-Dichloroethane-d4	17060-07-0	57.520	115.000	% Recov	12/15/04	82.000	138.000	
MSD	Toluene-d8	2037-26-5	55.020	110.000	% Recov	12/15/04	89.000	119.000	
MSD	Toluene	108-88-3	26.570	106.000	% Recov	12/15/04	76.000	120.000	
MSD	Trichloroethene	79-01-8	24.930	99.700	% Recov	12/15/04	73.000	123.000	
SPK-RPD	1,1-Dichloroethene	75-35-4	88.900	9.423	RPD	12/15/04	0.000	25.000	
SPK-RPD	Benzene	71-43-2	104.000	3.922	RPD	12/15/04	0.000	25.000	
SPK-RPD	4-Bromofluorobenzene	480-00-4	101.000	0.985	RPD	12/15/04	0.000	25.000	
SPK-RPD	Chlorobenzene	108-90-7	111.000	7.477	RPD	12/15/04	0.000	25.000	
SPK-RPD	1,2-Dichloroethane-d4	17060-07-0	115.000	2.575	RPD	12/15/04	0.000	25.000	
SPK-RPD	Toluene-d8	2037-26-5	110.000	1.835	RPD	12/15/04	0.000	25.000	
SPK-RPD	Toluene	108-88-3	106.000	7.031	RPD	12/15/04	0.000	25.000	
SPK-RPD	Trichloroethene	79-01-8	99.700	9.784	RPD	12/15/04	0.000	25.000	
SURR	4-Bromofluorobenzene	480-00-4	48.610	97.200	% Recov	12/15/04	71.000	125.000	
SURR	1,2-Dichloroethane-d4	17060-07-0	59.240	118.000	% Recov	12/15/04	80.000	134.000	

000029

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380
Matrix: SOLID
Test: VOA Ground Water Protection

SAF Number: F04-015
Sample Date: 12/10/04
Receive Date: 12/10/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
SURR	Toluene-d8	2037-26-5	52.590	105.000	% Recov	12/15/04	80.000	128.000	

Lab ID: W040002582
BATCH QC ASSOCIATED WITH SAMPLE

SURR	4-Bromofluorobenzene	480-00-4	51.010	102.000	% Recov	12/15/04	71.000	125.000	
SURR	1,2-Dichloroethane-d4	17060-07-0	57.380	115.000	% Recov	12/15/04	80.000	134.000	
SURR	Toluene-d8	2037-26-5	54.500	109.000	% Recov	12/15/04	80.000	128.000	

BATCH QC

BLANK	1,1-Dichloroethane	75-34-3	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	1,1,1-Trichloroethane	71-55-6	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	1,1,2-Trichloroethane	78-00-5	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	1,1,2,2-Tetrachloroethane	78-34-5	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	1,1-Dichloroethene	75-35-4	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	1,2-Dichloroethane	107-06-2	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	1,2-Dichloroethene(Total)	540-59-0	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	1-Butanol	71-36-3	< 40	n/a	ug/Kg	12/15/04			U
BLANK	2-Hexanone	591-78-6	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	4-Methyl-2-Pentanone	108-10-1	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	Acetone	67-64-1	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	Bromodichloromethane	75-27-4	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	Benzene	71-43-2	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	4-Bromofluorobenzene	480-00-4	50.470	101.000	% Recov	12/15/04	71.000	125.000	
BLANK	Bromoform	75-25-2	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	n-Butylbenzene	104-51-8	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	Carbon disulfide	75-15-0	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	Carbon tetrachloride	56-23-5	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	Dibromochloromethane	124-48-1	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	Chloroform	67-68-3	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	Chlorobenzene	108-90-7	< 2.0	n/a	ug/Kg	12/15/04			U

000030

WSCF ANALYTICAL LABORATORY QC REPORT

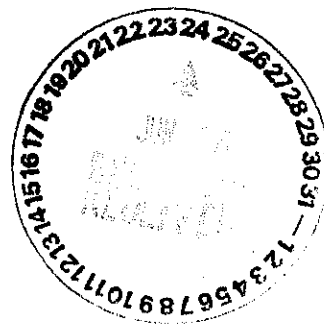
SDG Number: WSCF20042380
 Matrix: SOLID
 Test: VOA Ground Water Protection

SAF Number: F04-015
 Sample Date:
 Receive Date:

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
BLANK	cis-1,2-Dichloroethylene	156-59-2	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	cis-1,3-Dichloropropene	10061-01-5	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	Chloroethane	75-00-3	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	1,2-Dichloroethane-d4	17060-07-0	58.600	117.000	% Recov	12/15/04	80.000	134.000	
BLANK	trans-1,2-Dichloroethylene	156-60-5	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	1,2-Dichloropropane	78-87-5	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	Ethylbenzene	100-41-4	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	Bromomethane	74-83-9	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	Chloromethane	74-87-3	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	2-Butanone	78-93-3	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	Methylenechloride	75-09-2	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	Tetrachloroethene	127-18-4	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	Styrene	100-42-5	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	Xylenes (total)	1330-20-7	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	Toluene-d8	2037-26-5	53.440	107.000	% Recov	12/15/04	80.000	128.000	
BLANK	Toluene	108-88-3	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	trans-1,3-Dichloropropene	10061-02-6	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	Trichloroethene	79-01-6	< 2.0	n/a	ug/Kg	12/15/04			U
BLANK	Vinyl chloride	75-01-4	< 2.0	n/a	ug/Kg	12/15/04			U
LCS	1,1-Dichloroethene	75-35-4	22.350	89.400	% Recov	12/16/04	70.000	130.000	
LCS	Benzene	71-43-2	26.510	108.000	% Recov	12/16/04	70.000	130.000	
LCS	4-Bromofluorobenzene	480-00-4	52.290	105.000	% Recov	12/16/04	71.000	125.000	
LCS	Chlorobenzene	108-90-7	28.920	116.000	% Recov	12/16/04	70.000	130.000	
LCS	1,2-Dichloroethane-d4	17060-07-0	58.700	117.000	% Recov	12/16/04	80.000	134.000	
LCS	Toluene-d8	2037-26-5	54.400	109.000	% Recov	12/16/04	80.000	128.000	
LCS	Toluene	108-88-3	27.750	111.000	% Recov	12/16/04	70.000	130.000	
LCS	Trichloroethene	79-01-6	25.630	103.000	% Recov	12/16/04	70.000	130.000	

0000031

Date: 25 May 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-MW-1 Characterization Sampling and Analysis - Soil
Subject: Inorganics - Data Package No. WSCF20042380 (42380)



INTRODUCTION

This memo presents the results of data validation on Data Package No. 42380 prepared by WSCF Analytical Laboratories. (WSCF). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B19939	12/10/04	Soil	C	ICP/MS metals by 200.8.
B19940	12/10/04	Soil	C	ICP/MS metals by 200.8.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-MW-1 Miscellaneous Waste Group OU RI/FS Workplan, DOE/RL-2001-65 (Rev. 0), April 2002. Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

• Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 6 months for ICP metals and 28 days for mercury.

All holding times were acceptable.

000001

- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Matrix Spike Duplicate

Matrix spike (MS), matrix spike duplicate (MSD) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 75% to 125%. Samples with a spike recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 125% or less than 74% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 125% and a sample result less than the IDL, no qualification is required.

All MS/MSD results were acceptable.

000002

Laboratory Control Sample

The LCS is used to monitor the overall performance of all steps in the analysis. Recoveries must fall within the range of 80% to 120% for LCS analysis. Samples with a recovery of less than 50% are rejected and flagged "UR". Samples with a recovery of 50% to 79% and a sample recovery below the IDL are qualified "UJ". Samples with a recovery of greater than 120% or less than 80% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 120% and a sample result less than the IDL, no qualification is required.

All LCS results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike and matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than $\pm 35\%$, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (B19939/B19940) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Limits**

Reported analytical detection levels are compared against the required target quantitation limits (RTQLs) to ensure that laboratory detection levels meet the required criteria. All results met the analyte specific RTQL.

000003

- **Completeness**

Data package No. 42380 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2001-65, Rev. 0, *200-MW-1 Miscellaneous Waste Group OUs RI/FS Work Plan*, April 2002.

Appendix 1

Glossary of Data Reporting Qualifiers

000005

Qualifiers which may be applied by data validators in compliance with FHI validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

000006

Appendix 2
Summary of Data Qualification

000007

INORGANIC DATA QUALIFICATION SUMMARY*

SDG: 42380	REVIEWER: TLI	DATE: 5/25/05	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: FLUOR-HANFORD					
Laboratory: WSCF					
Case	SDG: WSCF20042380				
Sample Number	B19939		B19940		
Remarks			Duplicate		
Sample Date	12/10/04		12/10/04		
Inorganics	RTQL	Result	Q	Result	Q
Silver	0.5	<0.00981	U	<0.0101	U
Cadmium	0.5	<0.0196	U	<0.0202	U
Chromium	1	5.68		7.59	
Copper	2.5	11.4		12.7	
Lead	10	<0.255	U	<0.263	U
Mercury	0.2	0.586		0.713	
Uranium	1	0.331		0.320	

000010

WSCF ANALYTICAL RESULTS REPORT

Attention:
Project:

Steve Trent
F04-015: F04-015

Group #: WSCF20042380

Sample #	Client ID	CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
Inorganic													
WO40002581	B19939	TRENT	57-12-5	Cyanide	SOIL	LA-885-402	U	< 0.200	mg/kg	1.00	0.20	12/15/04	12/10/04
WO40002581	B19939	TRENT	TS	Total solids	SOIL	LA-519-412		90.7	%	1.00	0.0	12/15/04	12/10/04
WO40002581	B19939	TRENT	PH	pH Measurement	SOIL	LA-212-411		9.14	pH	1.00	0.010	12/11/04	12/10/04
WO40002581	B19939	TRENT	16984-48-8	Fluoride	SOIL	LA-533-410	U	1.15	mg/kg	50.00	1.2	01/05/05	12/10/04
WO40002581	B19939	TRENT	NO2-N	Nitrogen in Nitrite	SOIL	LA-533-410	U	0.950	mg/kg	50.00	0.95	01/05/05	12/10/04
WO40002581	B19939	TRENT	NO3-N	Nitrogen in Nitrate	SOIL	LA-533-410	B	2.58	mg/kg	50.00	0.65	01/05/05	12/10/04
WO40002581	B19939	TRENT	PO4-P	Phosphate (P) by IC	SOIL	LA-533-410	U	< 2.70	mg/kg	50.00	2.7	01/05/05	12/10/04
WO40002581	B19939	TRENT	14868-79-8	Sulfate	SOIL	LA-533-410	B	11.4	mg/kg	50.00	5.0	01/05/05	12/10/04
WO40002581	B19939	TRENT	7440-22-4	Silver	SOIL	LA-505-412	U	< 9.81e-03	mg/kg	9.81	9.8e-03	12/15/04	12/10/04
WO40002581	B19939	TRENT	7440-43-9	Cadmium	SOIL	LA-505-412	U	< 0.0196	mg/kg	9.81	0.020	12/15/04	12/10/04
WO40002581	B19939	TRENT	7440-47-3	Chromium	SOIL	LA-505-412		5.68	mg/kg	9.81	3.3	12/15/04	12/10/04
WO40002581	B19939	TRENT	7440-50-8	Copper	SOIL	LA-505-412		11.4	mg/kg	9.81	0.63	12/15/04	12/10/04
WO40002581	B19939	TRENT	7439-92-1	Lead	SOIL	LA-505-412	U	< 0.255	mg/kg	9.81	0.26	12/15/04	12/10/04
WO40002581	B19939	TRENT	7439-97-6	Mercury	SOIL	LA-505-412		0.586	mg/kg	9.81	9.8e-03	12/15/04	12/10/04
WO40002581	B19939	TRENT	7440-61-1	Uranium	SOIL	LA-505-412		0.331	mg/kg	9.81	0.18	12/15/04	12/10/04
WO40002582	B19940	TRENT	57-12-5	Cyanide	SOIL	LA-885-402	U	< 0.200	mg/kg	1.00	0.20	12/15/04	12/10/04
WO40002582	B19940	TRENT	TS	Total solids	SOIL	LA-519-412		94.8	%	1.00	0.0	12/15/04	12/10/04
WO40002582	B19940	TRENT	PH	pH Measurement	SOIL	LA-212-411		9.18	pH	1.00	0.010	12/11/04	12/10/04
WO40002582	B19940	TRENT	16984-48-8	Fluoride	SOIL	LA-533-410	U	< 1.15	mg/kg	50.00	1.2	01/05/05	12/10/04
WO40002582	B19940	TRENT	NO2-N	Nitrogen in Nitrite	SOIL	LA-533-410	U	< 0.950	mg/kg	50.00	0.95	01/05/05	12/10/04
WO40002582	B19940	TRENT	NO3-N	Nitrogen in Nitrate	SOIL	LA-533-410	B	2.34	mg/kg	50.00	0.65	01/05/05	12/10/04
WO40002582	B19940	TRENT	PO4-P	Phosphate (P) by IC	SOIL	LA-533-410	U	< 2.70	mg/kg	50.00	2.7	01/05/05	12/10/04
WO40002582	B19940	TRENT	14868-79-8	Sulfate	SOIL	LA-533-410	B	15.0	mg/kg	50.00	5.0	01/05/05	12/10/04
WO40002582	B19940	TRENT	7440-22-4	Silver	SOIL	LA-505-412	U	< 0.0101	mg/kg	10.10	0.010	12/15/04	12/10/04
WO40002582	B19940	TRENT	7440-43-9	Cadmium	SOIL	LA-505-412	U	< 0.0202	mg/kg	10.10	0.020	12/15/04	12/10/04
WO40002582	B19940	TRENT	7440-47-3	Chromium	SOIL	LA-505-412		7.59	mg/kg	10.10	3.4	12/15/04	12/10/04

MDL = Minimum Detection Limit

B - The analyte < the RDL but > = the IDL/MDL (inorganic)

U - Analyzed for but not detected above limiting criteria.

RQ = Result Qualifier

DF = Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Report WGPP/ver. 1.1

Groundwater Remediation Program

WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F04-015: F04-015

Group #: WSCF20042380

Sample #	Client ID	CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W040002582	B19940	TRENT	7440-50-8	Copper	SOIL	LA-505-412	12.7	mg/kg	10.10	0.85	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	7439-92-1	Lead	SOIL	LA-505-412 U	< 0.283	mg/kg	10.10	0.26	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	7439-97-6	Mercury	SOIL	LA-505-412	0.713	mg/kg	10.10	0.010	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	7440-81-1	Uranium	SOIL	LA-505-412	0.320	mg/kg	10.10	0.18	12/15/04	12/10/04	12/10/04

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5/22/05

MDL=Minimum Detection Limit
RQ=Result Qualifier

B - The analyte < the RDL but > = the IDL/MDL (inorganic)

U - Analyzed for but not detected above limiting criteria.

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Report WGPP/ver. 1.1

Groundwater Remediation Program

Page 8

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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Sample Delivery Group	WSCF20042380
Sample Matrix	Soil
Sample Visual	N/A
SAF Number	F04-015
Data Deliverable	Summary Report

Introduction

Two (2) 200-MW-1 Characterization Sampling and Analysis – Soil/216-U-3, 17.5' – 20', samples (B19939 and B19940) were received at the WSCF Laboratory on December 10, 2004. The samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Groundwater Remediation Program – Letter of Instruction*, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the Chain of Custody and Request for Sample Analysis forms are included as Attachment 3.

Analytical Methodology for Requested Analyses

Inorganic

- Anions by EPA Method 300. Analytical work was performed with no deviations to the approved method.
- Cyanide by EPA Method 600/R-94-111 300. Analytical work was performed with no deviations to the approved method.
- ICP-MS Metals by EPA Method 200.8. Analytical work was performed with no deviations to the approved method.
- Percent Solids by EPA Method 160.3. Analytical work was performed with no deviations to the approved method.
- pH by EPA Method 9045C. Analytical work was performed with no deviations to the approved method.

Organic

- PCB by EPA Method 8082. Analytical work was performed with no deviations to the approved method.

000014

- Semi-VOA by EPA Method 8270C. Analytical work was performed with no deviations to the approved method.
- TPH Diesel/Gas Range by WDOE Method NWTPH-Dx/Gx. Analytical work was performed with no deviations to the approved method.
- VOA by EPA Method 8260B. Analytical work was performed with no deviations to the approved method.

Radiochemistry

- All RadChem analyses (AEA (Plutonium, Americium and Uranium), GEA, Sr-89/90) were run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved method.

Inorganic Comments

Anions - The hold times for Nitrite and Nitrate analyses were not met. A Blank, Laboratory Control Sample, Duplicate, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See pages 13 through 14 for QC details.

Analytical Notes:

- Preparation Date: 06-jan-2005.
- Duplicate, Matrix Spike and Matrix Spike Duplicate QC samples were analyzed on sample# B19945 (SDG# 20042473, SAF# F04-015).
- Nitrate and Sulfate – Samples B19939 and B19940 results were B-flagged; the analyte was less than the reportable detection limit, but greater than or equal to the method detection limit.

All QC controls are within the established limits.

Cyanide- The hold time for this analysis was met. A Blank, Preparation Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See page 15 for QC details. All QC controls are within the established limits.

ICP-MS Metals – The hold time for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 16 through 21 for QC details. Analytical Notes:

- Preparation Date: 14-dec-2004.
- Spike Precision was evaluated on:
 - Uranium – Sample # B19939

000015

- Silver, Cadmium, Chromium, Copper, Mercury and Lead – Sample# B19974 (SDG# 20042382, SAF# F04-019).
- Copper, Mercury and Lead - The analytes detected in the associated preparation Blank sample were evaluated and there was no significant affect on the sample results.

All other QC controls are within the established limits.

Percent Solids – Analyzed for organic results correction.

pH – The hold times for this analysis was met. All internal laboratory controls were within established limits.

Organic Comments

- Sample results were moisture corrected and reported on a dry-weight basis.

PCB – The hold times for this analysis was met. A Blank, Duplicate, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 27 through 28 for QC details. Analytical Notes:

- Preparation Date: 13-dec-2004.
- Matrix Spike and Matrix Spike Duplicate QC samples were analyzed on sample# B19197 (SDG# 20042304, SAF# F03-025).
- Tetrachloro-m-xylene (surrogate) – Matrix Spike Duplicate and Laboratory Control Sample recoveries were below established laboratory limits and the matrix Relative Percent Difference exceeded established laboratory limits due to excessive blow down while concentration of the sample. The Decachlorobiphenyl and Aroclor-1254 recoveries were within established limits, so the sample B19939 and B19940 results were not flagged.

All other QC controls are within the established limits.

Semi-VOA – The hold times for this analysis was met. A Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 29 through 32 for QC details. Analytical Note:

- Preparation Date: 13-dec-2004.

All QC controls are within the established limits.

TPHD-WA-Diesel - The hold times for this analysis were met. A Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See page 33 for QC details. Analytical Note:

- Preparation Date: 13-dec-2004.

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All QC controls are within the established limits.

TPHD-WA-Gas - The hold times for this analysis were met. A Blank, Laboratory Control Sample, Duplicate Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See page 34 for QC details. Analytical Notes:

- Preparation Date: 15-dec-2004.
- Matrix Spike and Matrix Spike Duplicate QC samples were analyzed on sample# B19197 (SDG# 20042304, SAF# F03-025).
- Duplicate QC samples were analyzed on sample# B1B578 (SDG# 20042392, SAF# F03-006).
- Total Petroleum Hydrocarbons Gas – The Laboratory Control Sample recovery was below established laboratory limits. All other QC samples were within limits and the sample B19939 and B19940 results were not flagged.

All other QC controls are within the established limits.

VOA – The hold times for this analysis was met. A Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 35 through 37 for QC details. All QC controls are within the established limits.

Radiochemistry Comments

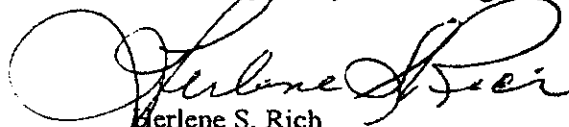
RadChem – There are no hold times associated with these WDOE accredited methods. A Blank, Laboratory Control Sample and Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 40 through 44 for QC details. All QC controls are within the established limits.

Radiochemical Tracer Percent Recovery			
Sample Number	Lab Sample ID	Isotope	Tracer Recovery (Percent)
BLANK		Pu-242	77.6
LCS		Pu-242	72.7
B19939	W040002581	Pu-242	66.8
DUPLICATE		Pu-242	75.2
B19940	W040002582	Pu-242	77.6

000017

Radiochemical Tracer Percent Recovery			
Sample Number	Lab Sample ID	Isotope	Tracer Recovery (Percent)
BLANK		Am-243	69.2
LCS		Am-243	99.3
B19939	W040002581	Am-243	90.1
DUPLICATE		Am-243	87.9
B19940	W040002582	Am-243	85.9
BLANK		Sr-85	96.0
LCS		Sr-85	94.6
B19939	W040002581	Sr-85	102.0
DUPLICATE		Sr-85	105.3
B19940	W040002582	Sr-85	93.1
BLANK		U-232	79.9
LCS		U-232	72.1
B19939	W040002581	U-232	77.5
DUPLICATE		U-232	85.1
B19940	W040002582	U-232	92.2

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.


 Gerlene S. Rich
 WSCF Production Control

000018

FLUOR Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						FO4-015-045		PAGE 1 OF 1	
COLLECTOR Pope/Plister/Hughes/Wiberg/Pope/Plister/Tyra/Wiberg		COMPANY CONTACT CS Caslock		TELEPHONE NO. 372-9638		PROJECT COORDINATOR TRENT, SJ		PRICE CODE 8N		DATA TURNAROUND	
SAMPLING LOCATION 215-U-3; 12/10/04 17.5-2054 4 12/10/04		PROJECT DESIGNATION 200-MW-1 Characterization Sampling and Analysis - Soil				SAF NO. FO4-015		AIR QUALITY <input type="checkbox"/>		45 Days / 45 Days	
ICE CHEST NO.		FIELD LOGBOOK NO. HNF-N-386 I		COA 119144ES10		METHOD OF SHIPMENT Government Vehicle					
SHIPPED TO Waste Sampling & Characterization		OFFSITE PROPERTY NO. N/A				BILL OF LADING/AIR BILL NO. N/A					
MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS N/A	PRESERVATION		Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None		
		TYPE OF CONTAINER		4G	4G	4G	4G*	4G	Square Bottle - Poly		
		NO. OF CONTAINER(S)		1	1	1	3	1	1		
		VOLUME		250mL	120mL	250mL	40mL	120mL	500mL		
SPECIAL HANDLING AND/OR STORAGE Radioactive Tie To: B19951 20042380		SAMPLE ANALYSIS		SEE ITEM (1) IN SPECIAL INSTRUCTIONS	PCN - R08;	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	SEE ITEM (4) IN SPECIAL INSTRUCTIONS	SEE ITEM (5) IN SPECIAL INSTRUCTIONS GEA		
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME								
B19939	SOIL W04002581	12/10/04	1050	X	X	X	X	X	X		
B19940	SOIL W04002582	12/10/04	1050	X	X	X	X	X	X		
CHAIN OF POSSESSION		SIGN/ PRINT NAMES				SPECIAL INSTRUCTIONS					
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	** The laboratory is to report both kerosene and diesel range compounds from the WTPH-D analysis. (1)IC Anions - 300.0 (Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate) Total Cyanide - 9010; pH (Soil) - 9045; (2)ICP/MS - 200.8 (TAL) (Cadmium, Chromium, Copper, Silver) ICP/MS - 200.8 (Add-on) (Lead, Uranium) 200.8 HG - ICP/MS (Mercury) (3)VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Butanol, cis-1,2-Dichloroethylene, n-Butylbenzene, trans-1,2-Dichloroethylene) (4)Semi-VOA - 8270A (Add-On) (Tributyl phosphate) TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D (Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range) (5)Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155) Isotopic Plutonium; Isotopic Uranium; Americium-241; Strontium-89,90 - Total Sr; GEA - Expedite 24 hr turn around 12/10/04							
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME								
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME								
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME								
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME								
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME								
LABORATORY SECTION	RECEIVED BY	TITLE				DATE/TIME					
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY				DATE/TIME					

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Appendix 5

Data Validation Supporting Documentation

000020

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200-MW-1		DATA PACKAGE: 42380		
VALIDATOR:	TLI	LAB:	WSCF	DATE: 5/13/05	
			SDG:	42380	
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide	200.8	
SAMPLES/MATRIX					
B19939 B19940					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes **No** N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? Yes No **N/A**Initial calibrations acceptable? Yes No **N/A**ICP interference checks acceptable? Yes No **N/A**ICV and CCV checks performed on all instruments? Yes No **N/A**ICV and CCV checks acceptable? Yes No **N/A**Standards traceable? Yes No **N/A**Standards expired? Yes No **N/A**Calculation check acceptable? Yes No **N/A**

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E)..... Yes No N/A
ICB and CCB results acceptable? (Levels D, E)..... Yes No N/A
Laboratory blanks analyzed?..... Yes No N/A
Laboratory blank results acceptable?..... Yes No N/A
Field blanks analyzed? (Levels C, D, E)..... Yes No N/A
Field blank results acceptable? (Levels C, D, E)..... Yes No N/A
Transcription/calculation errors? (Levels D, E)..... Yes No N/A
Comments: NO FB

4. ACCURACY (Levels C, D, and E)

MS/MSD samples analyzed?..... Yes No N/A
MS/MSD results acceptable?..... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E)..... Yes No N/A
MS/MSD standards expired? (Levels D, E)..... Yes No N/A
LCS/BSS samples analyzed?..... Yes No N/A
LCS/BSS results acceptable?..... Yes No N/A
Standards traceable? (Levels D, E)..... Yes No N/A
Standards expired? (Levels D, E)..... Yes No N/A
Transcription/calculation errors? (Levels D, E)..... Yes No N/A
Performance audit sample(s) analyzed?..... Yes No N/A
Performance audit sample results acceptable?..... Yes No N/A
Comments: NO PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable?	<u>Yes</u>	No	N/A
Duplicate results acceptable?	<u>Yes</u>	No	N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes	No	<u>N/A</u>
MS/MSD standards expired? (Levels D, E)	Yes	No	<u>N/A</u>
Field duplicate RPD values acceptable?	<u>Yes</u>	No	<u>N/A</u>
Field split RPD values acceptable?	Yes	No	<u>N/A</u>
Transcription/calculation errors? (Levels D, E)	Yes	No	<u>N/A</u>

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed?	Yes	No	<u>N/A</u>
ICP serial dilution %D values acceptable?	Yes	No	<u>N/A</u>
ICP post digestion spike required?	Yes	No	<u>N/A</u>
ICP post digestion spike values acceptable?	Yes	No	<u>N/A</u>
Standards traceable?	Yes	No	<u>N/A</u>
Standards expired?	Yes	No	<u>N/A</u>
Transcription/calculation errors?	Yes	No	<u>N/A</u>

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required?	Yes	No	N/A
Duplicate injection %RSD values acceptable?	Yes	No	N/A
Analytical spikes performed as required?	Yes	No	N/A
Analytical spike recoveries acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
MSA performed as required?	Yes	No	N/A
MSA results acceptable?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments: _____

8. HOLDING TIMES (all levels)

Samples properly preserved?	Yes	No	N/A
Sample holding times acceptable?	Yes	No	N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ☒ Yes ☐ No ☐ N/A

Results supported in the raw data? (Levels D, E)..... ☒ Yes ☐ No ☒ N/A

Samples properly prepared? (Levels D, E)..... ☒ Yes ☐ No ☒ N/A

Detection limits meet RDL? ☒ Yes ☐ No ☒ N/A

Transcription/calculation errors? (Levels D, E)..... ☒ Yes ☐ No ☒ N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

000026

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380
 Matrix: SOLID
 Test: ICP-2008 MS All possible metal

SAF Number: F04-015
 Sample Date: 12/09/04
 Receive Date: 12/09/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
MS	Copper	7440-50-8	352.85	88.213	% Recov	12/15/04	70.000	130.000	
MS	Mercury	7439-97-6	16.1271	80.635	% Recov	12/15/04	70.000	130.000	
MS	Lead	7439-92-1	358.217	89.554	% Recov	12/15/04	70.000	130.000	
MS	Uranium	7440-61-1	358.3268	89.582	% Recov	12/15/04	70.000	130.000	
MSD	Silver	7440-22-4	378.9	94.725	% Recov	12/15/04	70.000	130.000	
MSD	Cadmium	7440-43-9	394.5	98.625	% Recov	12/15/04	70.000	130.000	
MSD	Chromium	7440-47-3	358.5	89.625	% Recov	12/15/04	70.000	130.000	
MSD	Copper	7440-50-8	385.55	96.388	% Recov	12/15/04	70.000	130.000	
MSD	Mercury	7439-97-6	17.1371	85.686	% Recov	12/15/04	70.000	130.000	
MSD	Lead	7439-92-1	379.817	94.954	% Recov	12/15/04	70.000	130.000	
MSD	Uranium	7440-61-1	379.0268	94.757	% Recov	12/15/04	70.000	130.000	

Lab ID: W040002581

BATCH QC ASSOCIATED WITH SAMPLE

0000027	MS	Silver	7440-22-4	378.1	94.525	% Recov	12/15/04	70.000	130.000
	MS	Cadmium	7440-43-9	397.4	99.350	% Recov	12/15/04	70.000	130.000
	MS	Chromium	7440-47-3	346.9	86.725	% Recov	12/15/04	70.000	130.000
	MS	Copper	7440-50-8	374.73	93.683	% Recov	12/15/04	70.000	130.000
	MS	Mercury	7439-97-6	17.0837	85.418	% Recov	12/15/04	70.000	130.000
	MS	Lead	7439-92-1	375.7	93.925	% Recov	12/15/04	70.000	130.000
	MS	Uranium	7440-61-1	378.8689	94.717	% Recov	12/15/04	70.000	130.000
	MSD	Silver	7440-22-4	344.7	86.175	% Recov	12/15/04	70.000	130.000
	MSD	Cadmium	7440-43-9	384.6	96.150	% Recov	12/15/04	70.000	130.000
	MSD	Chromium	7440-47-3	349.6	87.400	% Recov	12/15/04	70.000	130.000
	MSD	Copper	7440-50-8	373.73	93.433	% Recov	12/15/04	70.000	130.000
	MSD	Mercury	7439-97-6	16.8737	84.368	% Recov	12/15/04	70.000	130.000
	MSD	Lead	7439-92-1	370.5	92.625	% Recov	12/15/04	70.000	130.000
	MSD	Uranium	7440-61-1	375.7889	93.942	% Recov	12/15/04	70.000	130.000
	SPK-RPD	Uranium	7440-61-1	93.942	0.822	RPD	12/15/04	0.000	20.000

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380
Matrix: SOLID
Test: ICP-2008 MS All possible metal

SAF Number: F04-015
Sample Date: 12/10/04
Receive Date: 12/10/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
Lab ID: W040002585									
BATCH QC ASSOCIATED WITH SAMPLE									
MS	Silver	7440-22-4	345.6302	86.408	% Recov	12/15/04	70.000	130.000	
MS	Cadmium	7440-43-9	365.6	91.400	% Recov	12/15/04	70.000	130.000	
MS	Chromium	7440-47-3	312.6	78.150	% Recov	12/15/04	70.000	130.000	
MS	Copper	7440-50-8	351.56	87.890	% Recov	12/15/04	70.000	130.000	
MS	Mercury	7439-97-6	16.0482	80.241	% Recov	12/15/04	70.000	130.000	
MS	Lead	7439-92-1	351.5	87.875	% Recov	12/15/04	70.000	130.000	
MSD	Silver	7440-22-4	349.1302	87.283	% Recov	12/15/04	70.000	130.000	
MSD	Cadmium	7440-43-9	378.7	94.675	% Recov	12/15/04	70.000	130.000	
MSD	Chromium	7440-47-3	332.4	83.100	% Recov	12/15/04	70.000	130.000	
MSD	Copper	7440-50-8	374.56	93.640	% Recov	12/15/04	70.000	130.000	
MSD	Mercury	7439-97-6	16.9582	84.791	% Recov	12/15/04	70.000	130.000	
MSD	Lead	7439-92-1	362.4	90.600	% Recov	12/15/04	70.000	130.000	
SPK-RPD	Silver	7440-22-4	87.283	1.008	RPD	12/15/04	0.000	20.000	
SPK-RPD	Cadmium	7440-43-9	94.675	3.520	RPD	12/15/04	0.000	20.000	
SPK-RPD	Chromium	7440-47-3	83.100	6.140	RPD	12/15/04	0.000	20.000	
SPK-RPD	Copper	7440-50-8	93.640	6.335	RPD	12/15/04	0.000	20.000	
SPK-RPD	Mercury	7439-97-6	84.791	5.514	RPD	12/15/04	0.000	20.000	
SPK-RPD	Lead	7439-92-1	90.600	3.054	RPD	12/15/04	0.000	20.000	
BATCH QC									
BLANK	Silver	7440-22-4	<1e-3	n/a	ug/L	12/15/04			U
BLANK	Cadmium	7440-43-9	<2e-3	n/a	ug/L	12/15/04			U
BLANK	Chromium	7440-47-3	<0.336	n/a	ug/L	12/15/04			U
BLANK	Copper	7440-50-8	0.3195	0.320	ug/L	12/15/04			
BLANK	Mercury	7439-97-6	5.595e-2	0.056	ug/L	12/15/04			
BLANK	Lead	7439-92-1	4.765e-2	0.048	ug/L	12/15/04			
BLANK	Uranium	7440-61-1	<1.6e-2	n/a	ug/L	12/15/04			U

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380
Matrix: SOLID
Test: ICP-2008 MS All possible metal

SAF Number: F04-015
Sample Date:
Receive Date:

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
LCS	Silver	7440-22-4	180.2	134.822	% Recov	12/15/04	110.000	170.000	
LCS	Cadmium	7440-43-9	72.86	105.918	% Recov	12/15/04	88.000	127.000	
LCS	Chromium	7440-47-3	77.53	89.630	% Recov	12/15/04	50.000	126.000	
LCS	Copper	7440-50-8	137.1	107.953	% Recov	12/15/04	61.000	134.000	
LCS	Mercury	7439-97-8	9.061	96.291	% Recov	12/15/04	75.000	114.000	
LCS	Lead	7439-92-1	87.71	92.815	% Recov	12/15/04	87.000	120.000	
LCS	Uranium	7440-61-1	370.5	92.625	% Recov	12/15/04	89.000	107.000	

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Date: 25 May 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-MW-1 Characterization Sampling and Analysis - Soil
Subject: Semivolatile - Data Package No.WSCF20042380 (42380)



INTRODUCTION

This memo presents the results of data validation on Data Package No. 42380 prepared by WSCF Analytical Laboratories (WSCF). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B19939	12/10/04	Soil	C	See note 1
B19940	12/10/04	Soil	C	See note 1

1 - Semivolatiles by 8270, TPH-D (diesel and kerosene), gasoline range organics and 1-butanol by 8015B.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-MW-1 Miscellaneous Waste Group OU RI/FS Workplan, DOE/RL-2001-65 (Rev. 0), April 2002. Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

- **Holding Times/Sample Preservation**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirement for semivolatile organics are extraction within 14 days of the date of sample collection and analysis within 40 days from the date of extraction. Method 8015B requires analysis within 14 days.

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If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

- **Method Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike

Matrix spike/matrix spike duplicate and blank spike sample analyses are used to assess the analytical accuracy of the reported data. Matrix spike/matrix duplicate results are used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and

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flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to an LCS recovery outside QC limits (81.8%), all gasoline range organic results were qualified as estimates and flagged "J".

All other matrix spike/matrix spike duplicate and blank spike results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of $\pm 35\%$. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All MS/MSD RPD results were acceptable.

Field Duplicate Samples

One set of field duplicates (B19939/B19940) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required target quantitation limits (RTQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RTQL.

- **Completeness**

Data package No. 42380 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to an recovery outside QC limits (81.8%), all gasoline range organic results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the FHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2001-65, Rev. 0, *200-MW-1 Miscellaneous Waste Group OUs RI/FS Work Plan*, April 2002.

Appendix 1

Glossary of Data Reporting Qualifiers

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Qualifiers which may be applied by data validators in compliance with the FHI validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

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Appendix 2
Summary of Data Qualification

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SEMIVOLATILE DATA QUALIFICATION SUMMARY*

SDG: 42380	REVIEWER: TLI	DATE: 5/25/05	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Gasoline range organics	J	All	LCS recovery

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: FLUOR-HANFORD					
Laboratory: WSCF					
Case:		SDG: WSCF20042380			
Sample Number		B19939		B19940	
Remarks				Duplicate	
Sample Date		12/10/04		12/10/04	
Analysis Date		12/27/04		12/28/04	
Semivolatile/8015	RTQL	Result	Q	Result	Q
4-Nitrophenol		<710	U	<680	U
1,4-Dichlorobenzene		<340	U	<330	U
Phenol	330	<110	U	<100	U
1,2,4-Trichlorobenzene		<320	U	<310	U
2,4-Dinitrotoluene		<73.0	U	<70.0	U
Pyrene		<73.0	U	<70.0	U
4-Chloro-3-methylphenol		<73.0	U	<70.0	U
N-Nitroso-di-n-propylamine		<73.0	U	<70.0	U
Acenaphthene		<73.0	U	<70.0	U
Pentachlorophenol		<330	U	<310	U
2-Chlorophenol		<180	U	<150	U
Tributyl phosphate	3300	<73.0	U	<70.0	U
TPH-D	5000	<4100	U	<3900	U
Kerosene	5000	<4100	U	<3900	U
TPH-G (gasoline range organics)	5000	<250	UJ	<250	UJ

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REVISED
5/2/05

* - The reported detection limit is above the RTQL

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F04-015: F04-015

Group #: WSCF20042380

Sample #	Client ID	CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
Organic													
W040002581	B19939	TRENT	TPH/GASOLINE	Total Pet. Hydrocarbons Gas	SOIL	LA-523-443	U J	< 250	ug/kg	1.00	2.5e+02	12/15/04	12/10/04
W040002581	B19939	TRENT	12674-11-2	Aroclor-1018	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04
W040002581	B19939	TRENT	11104-28-2	Aroclor-1221	SOIL	LA-523-427	U	< 130	ug/kg	1.00	1.3e+02	12/15/04	12/10/04
W040002581	B19939	TRENT	11181-16-5	Aroclor-1232	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04
W040002581	B19939	TRENT	53469-21-9	Aroclor-1242	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04
W040002581	B19939	TRENT	12672-29-6	Aroclor-1248	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04
W040002581	B19939	TRENT	11097-89-1	Aroclor-1254	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04
W040002581	B19939	TRENT	11098-82-5	Aroclor-1260	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04
W040002581	B19939	TRENT	37324-23-6	Aroclor-1262	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04
W040002581	B19939	TRENT	11100-14-4	Aroclor-1266	SOIL	LA-523-427	U	< 66.0	ug/kg	1.00	66	12/15/04	12/10/04
W040002581	B19939	TRENT	100-02-7	4-Nitrophenol	SOIL	LA-523-456	U	< 710	ug/kg	1.00	7.1e+02	12/27/04	12/10/04
W040002581	B19939	TRENT	106-46-7	1,4-Dichlorobenzene	SOIL	LA-523-456	U	< 340	ug/kg	1.00	3.4e+02	12/27/04	12/10/04
W040002581	B19939	TRENT	108-95-2	Phenol	SOIL	LA-523-456	U	< 110	ug/kg	1.00	1.1e+02	12/27/04	12/10/04
W040002581	B19939	TRENT	120-82-1	1,2,4-Trichlorobenzene	SOIL	LA-523-456	U	< 320	ug/kg	1.00	3.2e+02	12/27/04	12/10/04
W040002581	B19939	TRENT	121-14-2	2,4-Dinitrotoluene	SOIL	LA-523-456	U	< 73.0	ug/kg	1.00	73	12/27/04	12/10/04
W040002581	B19939	TRENT	129-00-0	Pyrene	SOIL	LA-523-456	U	< 73.0	ug/kg	1.00	73	12/27/04	12/10/04
W040002581	B19939	TRENT	59-50-7	4-Chloro-3-methylphenol	SOIL	LA-523-456	U	< 73.0	ug/kg	1.00	73	12/27/04	12/10/04
W040002581	B19939	TRENT	621-64-7	N-Nitrosodl-n-dipropylamine	SOIL	LA-523-456	U	< 73.0	ug/kg	1.00	73	12/27/04	12/10/04
W040002581	B19939	TRENT	83-32-9	Acenaphthene	SOIL	LA-523-456	U	< 73.0	ug/kg	1.00	73	12/27/04	12/10/04
W040002581	B19939	TRENT	87-86-5	Pentachlorophenol	SOIL	LA-523-456	U	< 330	ug/kg	1.00	3.3e+02	12/27/04	12/10/04
W040002581	B19939	TRENT	95-57-8	2-Chlorophenol	SOIL	LA-523-456	U	< 160	ug/kg	1.00	1.6e+02	12/27/04	12/10/04
W040002581	B19939	TRENT	126-73-8	Tributyl phosphate	SOIL	LA-523-456	U	< 73.0	ug/kg	1.00	73	12/27/04	12/10/04
W040002581	B19939	TRENT	75-35-4	1,1-Dichloroethene	SOIL	LA-523-456	U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04
W040002581	B19939	TRENT	79-01-6	Trichloroethene	SOIL	LA-523-456	U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04
W040002581	B19939	TRENT	71-43-2	Benzene	SOIL	LA-523-456	U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04
W040002581	B19939	TRENT	108-88-3	Toluene	SOIL	LA-523-456	U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04

MDL = Minimum Detection Limit
RQ = Result Qualifier

B - The analyte < the RDL but > = the IDL/MDL (inorganic)

U - Analyzed for but not detected above limiting criteria.

DF = Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Report WGPP/ver. 1.1

Groundwater Remediation Program

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WSCF ANALYTICAL RESULTS REPORT

Attention:
Project:

Steve Trent
F04-015: F04-015

Group #: WSCF20042380

Sample #	Client ID	CAS #	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W040002581	B19939	TRENT	70-09-5	1,1,2-Trichloroethane	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	79-34-5	1,1,2,2-Tetrachloroethane	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	71-36-3	1-Butanol	SOIL	LA-523-455 U	44.0	ug/kg	1.00	44	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	104-51-8	n-Butylbenzene	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	156-80-5	trans-1,2-Dichloroethylene	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	156-59-2	cis-1,2-Dichloroethylene	SOIL	LA-523-455 U	< 2.20	ug/kg	1.00	2.2	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	TPHDIESEL	Total Pet. Hydrocarbons Diesel	SOIL	NWTPH U	< 4.10e+03	ug/kg	1.00	4.1e+03	12/15/04	12/10/04	12/10/04
W040002581	B19939	TRENT	TPHKEROSENE	Kerosene	SOIL	NWTPH U	< 4.10e+03	ug/kg	1.00	4.1e+03	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	TPHGASOLINE	Total Pet. Hydrocarbons Gas	SOIL	LA-523-443 U	< 250	ug/kg	1.00	2.5e+02	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	12674-11-2	Aroclor-1248	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	11104-28-2	Aroclor-1221	SOIL	LA-523-427 U	< 120	ug/kg	1.00	1.2e+02	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	11144-16-5	Aroclor-1232	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	53469-21-9	Aroclor-1242	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	12672-29-6	Aroclor-1248	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	11097-69-1	Aroclor-1254	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	11096-82-5	Aroclor-1260	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	37324-23-5	Aroclor-1262	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	11106-14-4	Aroclor-1268	SOIL	LA-523-427 U	< 62.0	ug/kg	1.00	62	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	100-02-7	4-Nitrophenol	SOIL	LA-523-456 U	< 680	ug/kg	1.00	6.8e+02	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	106-46-7	1,4-Dichlorobenzene	SOIL	LA-523-456 U	< 330	ug/kg	1.00	3.3e+02	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	108-95-2	Phenol	SOIL	LA-523-456 U	< 100	ug/kg	1.00	1.0e+02	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	120-82-1	1,2,4-Trichlorobenzene	SOIL	LA-523-456 U	< 310	ug/kg	1.00	3.1e+02	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	121-14-2	2,4-Dinitrotoluene	SOIL	LA-523-456 U	< 70.0	ug/kg	1.00	70	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	129-00-0	Pyrene	SOIL	LA-523-456 U	< 70.0	ug/kg	1.00	70	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	59-50-7	4-Chloro-3-methylphenol	SOIL	LA-523-456 U	< 70.0	ug/kg	1.00	70	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	621-84-7	N-Nitrosodi-n-dipropylamine	SOIL	LA-523-456 U	< 70.0	ug/kg	1.00	70	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	83-32-9	Acenaphthene	SOIL	LA-523-456 U	< 70.0	ug/kg	1.00	70	12/28/04	12/10/04	12/10/04

MDL=Minimum Detection Limit

B - The analyte < the RDL but > = the IDL/MDL (inorganic)

U - Analyzed for but not detected above limiting criteria.

RQ=Result Qualifier

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - indicates more than six qualifier symbols

Report WGPP/ver. 1.1

Groundwater Remediation Program

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WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F04-015: F04-015

Group #: WSCF20042380

Sample #	Client ID	CAS #	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive	
W040002582	B19940	TRENT	87-86-5	Pentachlorophenol	SOIL	LA-523-456	U	< 310	ug/kg	1.00	3.1e+02	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	95-57-8	2-Chlorophenol	SOIL	LA-523-456	U	< 150	ug/kg	1.00	1.5e+02	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	126-73-8	Tributyl phosphate	SOIL	LA-523-456	U	< 70.0	ug/kg	1.00	70	12/28/04	12/10/04	12/10/04
W040002582	B19940	TRENT	75-35-4	1,1-Dichloroethane	SOIL	LA-523-456	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	78-01-6	Trichloroethene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	71-43-2	Benzene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	108-88-3	Toluene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	108-90-7	Chlorobenzene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	75-34-3	1,1-Dichloroethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	100-41-4	Ethylbenzene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	100-42-5	Styrene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	10061-01-5	cis-1,3-Dichloropropene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	10061-02-6	trans-1,3-Dichloropropene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	107-06-2	1,2-Dichloroethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	108-10-1	4-Methyl-2-Pentanone	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	124-48-1	Dibromochloromethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	127-18-4	Tetrachloroethene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	1330-20-7	Xylenes (total)	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	540-59-0	1,2-Dichloroethene(Total)	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	56-23-5	Carbon tetrachloride	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	591-78-6	2-Hexanone	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	67-64-1	Acetone	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	67-66-3	Chloroform	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	71-55-6	1,1,1-Trichloroethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	74-83-9	Bromomethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	74-87-3	Chloromethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	75-00-3	Chloroethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04

MDL = Minimum Detection Limit
RQ = Result Qualifier

B - The analyte < the RDL but > = the IDL/MDL (inorganic)

U - Analyzed for but not detected above limiting criteria.

DF = Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Report WGPP/ver. 1.1

Groundwater Remediation Program

Handwritten signature and date: 5/26/05

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WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F04-015: F04-015

Group #: WSCF20042380

WSCF														
Sample #	Client ID		CAS #	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W040002582	B19940	TRENT	75-01-4	Vinyl chloride	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	75-09-2	Methylenechloride	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	75-15-0	Carbon disulfide	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	75-25-2	Bromoform	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	75-27-4	Bromodichloromethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	78-67-5	1,2-Dichloropropane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	78-93-3	2-Butanone	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	79-00-5	1,1,2-Trichloroethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	79-34-5	1,1,2,2-Tetrachloroethane	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	71-36-3	1-Butanol	SOIL	LA-523-455	U	< 42.0	ug/kg	1.00	42	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	104-51-8	n-Butylbenzene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	156-60-5	trans-1,2-Dichloroethylene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	156-99-2	cis-1,2-Dichloroethylene	SOIL	LA-523-455	U	< 2.10	ug/kg	1.00	2.1	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	TPHDIESEL	Total Pet. Hydrocarbons Diesel	SOIL	NWTPH	U	< 3.90e+03	ug/kg	1.00	3.9e+03	12/15/04	12/10/04	12/10/04
W040002582	B19940	TRENT	TPHKEROSENE	Kerosene	SOIL	NWTPH	U	< 3.90e+03	ug/kg	1.00	3.9e+03	12/15/04	12/10/04	12/10/04

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✓ 5/21/05

MDL=Minimum Detection Limit
RQ=Result Qualifier

B - The analyte < the RDL but > = the IDL/MDL (inorganic)

U - Analyzed for but not detected above limiting criteria.

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

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Groundwater Remediation Program

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Sample Delivery Group	WSCF20042380
Sample Matrix	Soil
Sample Visual	N/A
SAF Number	F04-015
Data Deliverable	Summary Report

Introduction

Two (2) 200-MW-1 Characterization Sampling and Analysis – Soil/216-U-3, 17.5' – 20', samples (B19939 and B19940) were received at the WSCF Laboratory on December 10, 2004. The samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Groundwater Remediation Program – Letter of Instruction*, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the Chain of Custody and Request for Sample Analysis forms are included as Attachment 3.

Analytical Methodology for Requested Analyses

Inorganic

- Anions by EPA Method 300. Analytical work was performed with no deviations to the approved method.
- Cyanide by EPA Method 600/R-94-111 300. Analytical work was performed with no deviations to the approved method.
- ICP-MS Metals by EPA Method 200.8. Analytical work was performed with no deviations to the approved method.
- Percent Solids by EPA Method 160.3. Analytical work was performed with no deviations to the approved method.
- pH by EPA Method 9045C. Analytical work was performed with no deviations to the approved method.

Organic

- PCB by EPA Method 8082. Analytical work was performed with no deviations to the approved method.

- Semi-VOA by EPA Method 8270C. Analytical work was performed with no deviations to the approved method.
- TPH Diesel/Gas Range by WDOE Method NWTPH-Dx/Gx. Analytical work was performed with no deviations to the approved method.
- VOA by EPA Method 8260B. Analytical work was performed with no deviations to the approved method.

Radiochemistry

- All RadChem analyses (AEA (Plutonium, Americium and Uranium), GEA, Sr-89/90) were run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved method.

Inorganic Comments

Anions - The hold times for Nitrite and Nitrate analyses were not met. A Blank, Laboratory Control Sample, Duplicate, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See pages 13 through 14 for QC details.

Analytical Notes:

- Preparation Date: 06-jan-2005.
- Duplicate, Matrix Spike and Matrix Spike Duplicate QC samples were analyzed on sample# B19945 (SDG# 20042473, SAF# F04-015).
- Nitrate and Sulfate – Samples B19939 and B19940 results were B-flagged; the analyte was less than the reportable detection limit, but greater than or equal to the method detection limit.

All QC controls are within the established limits.

Cyanide- The hold time for this analysis was met. A Blank, Preparation Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See page 15 for QC details. All QC controls are within the established limits.

ICP-MS Metals – The hold time for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 16 through 21 for QC details. Analytical Notes:

- Preparation Date: 14-dec-2004.
- Spike Precision was evaluated on:
 - Uranium – Sample # B19939

- Silver, Cadmium, Chromium, Copper, Mercury and Lead – Sample# B19974 (SDG# 20042382, SAF# F04-019).
- Copper, Mercury and Lead - The analytes detected in the associated preparation Blank sample were evaluated and there was no significant affect on the sample results.

All other QC controls are within the established limits.

Percent Solids – Analyzed for organic results correction.

pH – The hold times for this analysis was met. All internal laboratory controls were within established limits.

Organic Comments

- Sample results were moisture corrected and reported on a dry-weight basis.

PCB – The hold times for this analysis was met. A Blank, Duplicate, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 27 through 28 for QC details. Analytical Notes:

- Preparation Date: 13-dec-2004.
- Matrix Spike and Matrix Spike Duplicate QC samples were analyzed on sample# B19197 (SDG# 20042304, SAF# F03-025).
- Tetrachloro-m-xylene (surrogate) – Matrix Spike Duplicate and Laboratory Control Sample recoveries were below established laboratory limits and the matrix Relative Percent Difference exceeded established laboratory limits due to excessive blow down while concentration of the sample. The Decachlorobiphenyl and Aroclor-1254 recoveries were within established limits, so the sample B19939 and B19940 results were not flagged.

All other QC controls are within the established limits.

Semi-VOA – The hold times for this analysis was met. A Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 29 through 32 for QC details. Analytical Note:

- Preparation Date: 13-dec-2004.

All QC controls are within the established limits.

TPHD-WA-Diesel - The hold times for this analysis were met. A Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See page 33 for QC details. Analytical Note:

- Preparation Date: 13-dec-2004.

All QC controls are within the established limits.

TPHD-WA-Gas - The hold times for this analysis were met. A Blank, Laboratory Control Sample, Duplicate Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per GPP Letter of Instruction. See page 34 for QC details. Analytical Notes:

- Preparation Date: 15-dec-2004.
- Matrix Spike and Matrix Spike Duplicate QC samples were analyzed on sample# B19197 (SDG# 20042304, SAF# F03-025).
- Duplicate QC samples were analyzed on sample# B1B578 (SDG# 20042392, SAF# F03-006).
- Total Petroleum Hydrocarbons Gas – The Laboratory Control Sample recovery was below established laboratory limits. All other QC samples were within limits and the sample B19939 and B19940 results were not flagged.

All other QC controls are within the established limits.

VOA – The hold times for this analysis was met. A Blank, Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 35 through 37 for QC details. All QC controls are within the established limits.

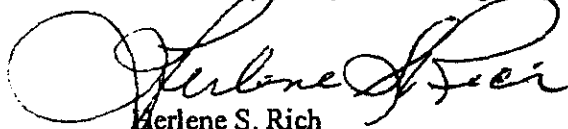
Radiochemistry Comments

RadChem – There are no hold times associated with these WDOE accredited methods. A Blank, Laboratory Control Sample and Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See pages 40 through 44 for QC details. All QC controls are within the established limits.

Radiochemical Tracer Percent Recovery			
Sample Number	Lab Sample ID	Isotope	Tracer Recovery (Percent)
BLANK		Pu-242	77.6
LCS		Pu-242	72.7
B19939	W040002581	Pu-242	66.8
DUPLICATE		Pu-242	75.2
B19940	W040002582	Pu-242	77.6

Radiochemical Tracer Percent Recovery			
Sample Number	Lab Sample ID	Isotope	Tracer Recovery (Percent)
BLANK		Am-243	69.2
LCS		Am-243	99.3
B19939	W040002581	Am-243	90.1
DUPLICATE		Am-243	87.9
B19940	W040002582	Am-243	85.9
BLANK		Sr-85	96.0
LCS		Sr-85	94.6
B19939	W040002581	Sr-85	102.0
DUPLICATE		Sr-85	105.3
B19940	W040002582	Sr-85	93.1
BLANK		U-232	79.9
LCS		U-232	72.1
B19939	W040002581	U-232	77.5
DUPLICATE		U-232	85.1
B19940	W040002582	U-232	92.2

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.


 Darlene S. Rich
 WSCF Production Control

FLUOR Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					FO4-015-045		PAGE 1 OF 1			
COLLECTOR Pope/Plister/Hughes/Wiberg/Pope/Plister/Tyra/Wiberg		COMPANY CONTACT CS Clearlock		TELEPHONE NO. 372-9638		PROJECT COORDINATOR TRENT, SJ		PRICE CODE BN		DATA TURNAROUND 45 Days / 45 Days		
SAMPLING LOCATION 216-U-3; 12-11-11-11 17.5-20.4 15 12/10/04		PROJECT DESIGNATION 200-MW-1 Characterization Sampling and Analysis - Soil				SAF NO. FO4-015		AIR QUALITY <input type="checkbox"/>				
ICE CHEST NO.		FIELD LOGBOOK NO. HNF-N-386 I		COA 119144ES10		METHOD OF SHIPMENT Government Vehicle						
SHIPPED TO Waste Sampling & Characterization		OFFSITE PROPERTY NO. N/A				BILL OF LADING/AIR BILL NO. N/A						
MATRIX* A=Air DL=Drum Liquids DG=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS N/A	PRESERVATION		Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None			
		TYPE OF CONTAINER		gG	gG	gG	gG*	gG	Square Bottle - Poly			
		NO. OF CONTAINER(S)		1	1	1	3	1	1			
		VOLUME		250mL	120mL	250mL	40mL	120mL	500mL			
SPECIAL HANDLING AND/OR STORAGE Radioactive Tie To: B19951 20042380		SAMPLE ANALYSIS		SEE ITEM (1) IN SPECIAL INSTRUCTIONS	PCN - 8082	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	SEE ITEM (4) IN SPECIAL INSTRUCTIONS	SEE ITEM (5) IN SPECIAL INSTRUCTIONS	GEA		
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
B19939	SOIL W04002581	12/10/04	1050	X	X	X	X	X	X			
B19940	SOIL W04002582	12/10/04	1050	X	X	X	X	X	X			
CHAIN OF POSSESSION												
SIGN/ PRINT NAMES				SPECIAL INSTRUCTIONS								
RELINQUISHED BY/ REMOVED FROM		DATE/TIME		RECEIVED BY/ STORED IN		DATE/TIME		** The laboratory is to report both kerosene and diesel range compounds from the WTPH-D analysis. (1)IC Anions - 300.0 (Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate) Total Cyanide - 9010; pH (Soil) - 9045; (2)ICP/MS - 200.8 (TAL) (Cadmium, Chromium, Copper, Silver) ICP/MS - 200.8 (Add-on) (Lead, Uranium) 200.8_HG - ICPMS (Mercury) (3)VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Butanol, cis-1,2-Dichloroethylene, n-Butylbenzene, trans-1,2-Dichloroethylene) (4)Semi-VOA - 8270A (Add-On) (Tributyl phosphate) TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D (Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range) (5)Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155) Isotopic Plutonium; Isotopic Uranium; Americium-241; Strontium-89,90 -- Total Sr; GEA - Expedite 24 hr turn around JT 12/10/04				
RELINQUISHED BY/ REMOVED FROM		DATE/TIME		RECEIVED BY/ STORED IN		DATE/TIME						
RELINQUISHED BY/ REMOVED FROM		DATE/TIME		RECEIVED BY/ STORED IN		DATE/TIME						
RELINQUISHED BY/ REMOVED FROM		DATE/TIME		RECEIVED BY/ STORED IN		DATE/TIME						
RELINQUISHED BY/ REMOVED FROM		DATE/TIME		RECEIVED BY/ STORED IN		DATE/TIME						
RELINQUISHED BY/ REMOVED FROM		DATE/TIME		RECEIVED BY/ STORED IN		DATE/TIME						
LABORATORY SECTION	RECEIVED BY			TITLE				DATE/TIME				
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD			DISPOSED BY				DATE/TIME				

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Appendix 5

Data Validation Supporting Documentation

000022

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT:	200-MW-1		DATA PACKAGE: 42380		
VALIDATOR:	TLI	LAB:	WSCF	DATE:	5/12/02
			SDG:	42380	
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	<u>SW-846 8270</u>	<u>8015B</u>	SW-846 8270 (TCLP)
SAMPLES/MATRIX					
B19939 B19946					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? Yes No N/AInitial calibrations acceptable? Yes No N/AContinuing calibrations acceptable? Yes No N/AStandards traceable? Yes No N/AStandards expired? Yes No N/ACalculation check acceptable? Yes No N/A

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) Yes No N/A
Calibration blank results acceptable? (Levels D, E) Yes No N/A
Laboratory blanks analyzed? Yes No N/A
Laboratory blank results acceptable? Yes No N/A
Field/trip blanks analyzed? (Levels C, D, E) Yes No N/A
Field/trip blank results acceptable? (Levels C, D, E) Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A
Comments: NO FB

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? Yes No N/A
Surrogate/system monitoring compound recoveries acceptable? Yes No N/A
Surrogates traceable? (Levels D, E) Yes No N/A
Surrogates expired? (Levels D, E) Yes No N/A
MS/MSD samples analyzed? Yes No N/A
MS/MSD results acceptable? Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
MS/MSD standards? (Levels D, E) Yes No N/A
LCS/BSS samples analyzed? Yes No N/A
LCS/BSS results acceptable? Yes No N/A
Standards traceable? (Levels D, E) Yes No N/A
Standards expired? (Levels D, E) Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A
Performance audit sample(s) analyzed? Yes No N/A
Performance audit sample results acceptable? Yes No N/A
Comments: NO PK

QAO - 81.170 - J all (outside lab QC)

GC/MS ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

MS/MSD samples analyzed? Yes No N/A
MS/MSD RPD values acceptable? Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
MS/MSD standards expired? (Levels D, E) Yes No N/A
Field duplicate RPD values acceptable? Yes No N/A
Field split RPD values acceptable? Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? Yes No N/A
Internal standard areas acceptable? Yes No N/A
Internal standard retention times acceptable? Yes No N/A
Standards traceable? Yes No N/A
Standards expired? Yes No N/A
Transcription/calculation errors? Yes No N/A

Comments: _____

7. HOLDING TIMES (all levels)

Samples properly preserved? Yes No N/A
Sample holding times acceptable? Yes No N/A

Comments: W/ TRU C - 15 days - 42x - 3 all S/R

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GC/MS ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E)	Yes	No	N/A
Compound quantitation acceptable? (Levels D, E)	Yes	No	N/A
Results reported for all requested analyses?	Yes	No	N/A
Results supported in the raw data? (Levels D, E)	Yes	No	N/A
Samples properly prepared? (Levels D, E)	Yes	No	N/A
Laboratory properly identified and coded all TIC? (Levels D, E)	Yes	No	N/A
Detection limits meet RDL?	Yes	No	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	N/A

Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed?	Yes	No	N/A
GPC check performed?	Yes	No	N/A
GPC check recoveries acceptable?	Yes	No	N/A
GPC calibration performed?	Yes	No	N/A
GPC calibration check performed?	Yes	No	N/A
GPC calibration check retention times acceptable?	Yes	No	N/A
Check/calibration materials traceable?	Yes	No	N/A
Check/calibration materials Expired?	Yes	No	N/A
Analytical batch QC given similar cleanup?	Yes	No	N/A
Transcription/Calculation Errors?	Yes	No	N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

000027

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380
Matrix: SOLID
Test: SW-846 8270B Semi-Vols

SAF Number: F04-015
Sample Date: 12/10/04
Receive Date: 12/10/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
Lab ID: W040002581 BATCH QC ASSOCIATED WITH SAMPLE									
SURR	2-Fluorophenol	387-12-4	3487.2	95.200	% Recov	12/27/04	42.000	105.000	
SURR	2-Fluorobiphenyl	321-80-8	3307.8	90.300	% Recov	12/27/04	58.000	122.000	
SURR	Nitrobenzene-d5	4165-60-0	3163.6	86.400	% Recov	12/27/04	84.000	111.000	
SURR	Phenol-d5	4165-62-2	3597.8	98.200	% Recov	12/27/04	54.000	120.000	
SURR	2,4,6-Tribromophenol	118-79-8	3008.4	82.100	% Recov	12/27/04	24.000	122.000	
SURR	Terphenyl-d14 (7CI)	98904-43-9	3214.6	87.800	% Recov	12/27/04	35.000	150.000	
Lab ID: W040002582 BATCH QC ASSOCIATED WITH SAMPLE									
MS	1,2,4-Trichlorobenzene	120-82-1	2961.9	84.700	% Recov	12/22/04	48.000	107.000	
MS	1,4-Dichlorobenzene	106-46-7	2872.5	82.200	% Recov	12/22/04	30.000	98.000	
MS	2,4-Dinitrotoluene	121-14-2	2825.9	80.800	% Recov	12/22/04	59.000	106.000	
MS	2-Fluorophenol	387-12-4	3119.9	89.200	% Recov	12/22/04	42.000	105.000	
MS	Acenaphthene	83-32-9	3226.6	92.300	% Recov	12/22/04	61.000	116.000	
MS	4-Chloro-3-methylphenol	59-50-7	4806.0	91.700	% Recov	12/22/04	61.000	106.000	
MS	2-Chlorophenol	95-57-8	4382.0	83.600	% Recov	12/22/04	68.000	106.000	
MS	N-Nitrosodi-n-dipropylamine	621-64-7	3334.7	95.400	% Recov	12/22/04	71.000	114.000	
MS	2-Fluorobiphenyl	321-80-8	3037.1	86.900	% Recov	12/22/04	58.000	122.000	
MS	Phenol	108-95-2	5033.6	96.000	% Recov	12/22/04	42.000	111.000	
MS	Nitrobenzene-d5	4165-60-0	3241.8	92.700	% Recov	12/22/04	64.000	111.000	
MS	4-Nitrophenol	100-02-7	5048.7	96.300	% Recov	12/22/04	32.000	118.000	
MS	Pentachlorophenol	87-86-5	4082.1	77.800	% Recov	12/22/04	62.000	114.000	
MS	Phenol-d5	4165-62-2	3408.5	97.500	% Recov	12/22/04	54.000	120.000	
MS	Pyrene	129-00-0	2863.3	81.900	% Recov	12/22/04	66.000	118.000	
MS	2,4,6-Tribromophenol	118-79-8	3209.4	91.800	% Recov	12/22/04	24.000	122.000	
MS	Terphenyl-d14 (7CI)	98904-43-9	3128.5	89.500	% Recov	12/22/04	35.000	150.000	

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380
Matrix: SOLID
Test: SW-846 8270B Semi-Vols

SAF Number: F04-015
Sample Date: 12/10/04
Receive Date: 12/10/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
MSD	1,2,4-Trichlorobenzene	120-82-1	2829.6	81.000	% Recov	12/22/04	46.000	107.000	
MSD	1,4-Dichlorobenzene	106-46-7	2727.4	78.100	% Recov	12/22/04	30.000	96.000	
MSD	2,4-Dinitrotoluene	121-14-2	2690.2	77.000	% Recov	12/22/04	59.000	106.000	
MSD	2-Fluorophenol	367-12-4	3026.0	86.600	% Recov	12/22/04	42.000	105.000	
MSD	Acenaphthene	83-32-9	3025.5	86.600	% Recov	12/22/04	61.000	116.000	
MSD	4-Chloro-3-methylphenol	59-50-7	4603.5	87.900	% Recov	12/22/04	61.000	106.000	
MSD	2-Chlorophenol	95-57-8	4113.5	78.500	% Recov	12/22/04	66.000	106.000	
MSD	N-Nitrosodi-n-dipropylamine	621-64-7	3239.2	92.700	% Recov	12/22/04	71.000	114.000	
MSD	2-Fluorobiphenyl	321-60-8	2961.6	84.800	% Recov	12/22/04	56.000	122.000	
MSD	Phenol	108-95-2	4875.8	83.100	% Recov	12/22/04	42.000	111.000	
MSD	Nitrobenzene-d5	4165-60-0	3161.2	90.500	% Recov	12/22/04	64.000	111.000	
MSD	4-Nitrophenol	100-02-7	4830.5	92.200	% Recov	12/22/04	32.000	118.000	
MSD	Pentachlorophenol	87-86-5	3962.4	75.600	% Recov	12/22/04	62.000	114.000	
MSD	Phenol-d5	4165-62-2	2846.9	81.500	% Recov	12/22/04	54.000	120.000	
MSD	Pyrene	129-00-0	2748.0	78.700	% Recov	12/22/04	66.000	118.000	
MSD	2,4,6-Tribromophenol	118-79-8	2965.3	84.900	% Recov	12/22/04	24.000	122.000	
MSD	Terphenyl-d14 (7Cl)	98904-43-9	3030.8	86.800	% Recov	12/22/04	35.000	150.000	
SPK-RPD	1,2,4-Trichlorobenzene	120-82-1	81.000	4.466	RPD	12/29/04	0.000	20.000	
SPK-RPD	1,4-Dichlorobenzene	106-46-7	78.100	5.115	RPD	12/29/04	0.000	20.000	
SPK-RPD	2,4-Dinitrotoluene	121-14-2	77.000	4.816	RPD	12/29/04	0.000	20.000	
SPK-RPD	2-Fluorophenol	367-12-4	86.600	2.958	RPD	12/29/04	0.000	20.000	
SPK-RPD	Acenaphthene	83-32-9	86.600	6.372	RPD	12/29/04	0.000	20.000	
SPK-RPD	4-Chloro-3-methylphenol	59-50-7	87.900	4.232	RPD	12/29/04	0.000	20.000	
SPK-RPD	2-Chlorophenol	95-57-8	78.500	6.292	RPD	12/29/04	0.000	20.000	
SPK-RPD	N-Nitrosodi-n-dipropylamine	621-64-7	92.700	2.871	RPD	12/29/04	0.000	20.000	
SPK-RPD	2-Fluorobiphenyl	321-60-8	84.800	2.446	RPD	12/29/04	0.000	20.000	
SPK-RPD	Phenol	108-95-2	93.100	3.067	RPD	12/29/04	0.000	20.000	
SPK-RPD	Nitrobenzene-d5	4165-60-0	90.500	2.402	RPD	12/29/04	0.000	20.000	
SPK-RPD	4-Nitrophenol	100-02-7	92.200	4.350	RPD	12/29/04	0.000	20.000	
SPK-RPD	Pentachlorophenol	87-86-5	75.600	2.868	RPD	12/29/04	0.000	20.000	

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380
Matrix: SOLID
Test: SW-846 8270B Semi-Vols

SAF Number: F04-015
Sample Date: 12/10/04
Receive Date: 12/10/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
SPK-RPD	Phenol-d5	4165-82-2	81.500	17.877	RPD	12/29/04	0.000	20.000	
SPK-RPD	Pyrene	129-00-0	78.700	3.985	RPD	12/29/04	0.000	20.000	
SPK-RPD	2,4,6-Tribromophenol	118-79-6	84.900	7.810	RPD	12/29/04	0.000	20.000	
SPK-RPD	Terphenyl-d14 (7Cl)	98904-43-9	86.800	3.083	RPD	12/29/04	0.000	20.000	
SURR	2-Fluorophenol	367-12-4	3241.1	92.700	% Recov	12/28/04	42.000	105.000	
SURR	2-Fluorobiphenyl	321-60-8	3145.4	90.000	% Recov	12/28/04	56.000	122.000	
SURR	Nitrobenzene-d5	4165-60-0	3000.1	85.800	% Recov	12/28/04	64.000	111.000	
SURR	Phenol-d5	4165-82-2	3422.1	97.900	% Recov	12/28/04	54.000	120.000	
SURR	2,4,6-Tribromophenol	118-79-6	2888.8	82.800	% Recov	12/28/04	24.000	122.000	
SURR	Terphenyl-d14 (7Cl)	98904-43-9	3131.7	89.800	% Recov	12/28/04	35.000	150.000	
BATCH QC									
BLANK	1,2,4-Trichlorobenzene	120-82-1	< 290	n/a	ug/Kg	12/22/04			U
BLANK	1,4-Dichlorobenzene	106-46-7	< 310	n/a	ug/Kg	12/22/04			U
BLANK	2,4-Dinitrotoluene	121-14-2	< 67	n/a	ug/Kg	12/22/04			U
BLANK	2-Fluorophenol	367-12-4	2255.7	67.700	% Recov	12/22/04	42.000	105.000	
BLANK	Acenaphthene	83-32-9	< 67	n/a	ug/Kg	12/22/04			U
BLANK	4-Chloro-3-methylphenol	59-50-7	< 67	n/a	ug/Kg	12/22/04			U
BLANK	2-Chlorophenol	95-57-8	< 150	n/a	ug/Kg	12/22/04			U
BLANK	N-Nitrosodi-n-dipropylamine	621-64-7	< 67	n/a	ug/Kg	12/22/04			U
BLANK	2-Fluorobiphenyl	321-60-8	2559.3	76.800	% Recov	12/22/04	56.000	122.000	
BLANK	Phenol	108-95-2	< 100	n/a	ug/Kg	12/22/04			U
BLANK	Nitrobenzene-d5	4165-60-0	2771.8	83.200	% Recov	12/22/04	64.000	111.000	
BLANK	4-Nitrophenol	100-02-7	< 650	n/a	ug/Kg	12/22/04			U
BLANK	Pentachlorophenol	87-88-5	< 300	n/a	ug/Kg	12/22/04			U
BLANK	Phenol-d5	4165-82-2	2263.9	67.900	% Recov	12/22/04	54.000	120.000	
BLANK	Pyrene	129-00-0	< 67	n/a	ug/Kg	12/22/04			U
BLANK	Tributyl phosphate	126-73-8	< 67	n/a	ug/Kg	12/22/04			U
BLANK	2,4,6-Tribromophenol	118-79-6	2001.2	60.000	% Recov	12/22/04	24.000	122.000	
BLANK	Terphenyl-d14 (7Cl)	98904-43-9	2527.8	75.800	% Recov	12/22/04	35.000	150.000	

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380
 Matrix: SOLID
 Test: WTPH-D TPH Diesel Range (Wa)

SAF Number: F04-015
 Sample Date: 12/10/04
 Receive Date: 12/10/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
Lab ID: W040002581 BATCH QC ASSOCIATED WITH SAMPLE									
SURR	ortho-Terphenyl	Surr	84-15-1	27299	99.200	% Recov	12/15/04	70.000	130.000
Lab ID: W040002582 BATCH QC ASSOCIATED WITH SAMPLE									
MS	Kerosene		TPHKEROSENE	125310	95.300	% Recov	12/15/04	70.000	130.000
MS	ortho-Terphenyl	Surr	84-15-1	27201	103.000	% Recov	12/15/04	70.000	130.000
MSD	Kerosene		TPHKEROSENE	121810	92.500	% Recov	12/15/04	70.000	130.000
MSD	ortho-Terphenyl	Surr	84-15-1	27480	104.000	% Recov	12/15/04	70.000	130.000
SPK-RPD	ortho-Terphenyl	Surr	84-15-1	104.000	0.966	RPD	12/15/04	0.000	20.000
SURR	ortho-Terphenyl	Surr	84-15-1	25049	95.400	% Recov	12/15/04	70.000	130.000
BATCH QC									
BLANK	Kerosene		TPHKEROSENE	< 3800	n/a	ug/Kg	12/15/04		U
BLANK	ortho-Terphenyl	Surr	84-15-1	23436	93.700	% Recov	12/15/04	70.000	130.000
BLANK	Total Pet. Hydrocarbons Diesel		TPHDIESEL	< 3800	n/a	ug/Kg	12/15/04		U
LCS	ortho-Terphenyl	Surr	84-15-1	49132	98.300	% Recov	12/15/04	70.000	130.000
LCS	Total Pet. Hydrocarbons Diesel		TPHDIESEL	117760	94.200	% Recov	12/15/04	80.000	120.000

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WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042380
 Matrix: SOLID
 Test: NWTPH-GX TPH Gasoline Range

SAF Number: F04-015
 Sample Date: 12/02/04
 Receive Date: 12/02/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
Lab ID: W040002532 BATCH QC ASSOCIATED WITH SAMPLE									
MS	Total Pet. Hydrocarbons Gas	TPHGASOLINE	3500	97.222	% Recov	12/15/04	50.000	150.000	
MSD	Total Pet. Hydrocarbons Gas	TPHGASOLINE	3600	100.000	% Recov	12/15/04	50.000	150.000	
SPK-RPD	Total Pet. Hydrocarbons Gas	TPHGASOLINE	100.000	2.817	RPD	12/15/04	0.000	20.000	
Lab ID: W040002592 BATCH QC ASSOCIATED WITH SAMPLE									
DUP	Total Pet. Hydrocarbons Gas	TPHGASOLINE	<250	n/a	RPD	12/15/04	0.000	20.000	U
BATCH QC									
BLANK	Total Pet. Hydrocarbons Gas	TPHGASOLINE	<250	n/a	mg/L	12/15/04	0.000	300.000	U
LCS	Total Pet. Hydrocarbons Gas	TPHGASOLINE	1044	81.818	% Recov	12/15/04	85.000	115.000	

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